36-60 McCaul Street Redevelopment

SITE SERVICING AND STAGE 1 STORMWATER MANAGEMENT REPORT

City of Toronto

FINAL

Prepared for Deltera Inc.

June 2014

RVA #132758

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36-60 MCCAUL STREET REDEVELOPMENT

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1.0 INTRODUCTION

The subject site is located on the west side of McCaul Street, between Stephanie Street and Grange Road in the City of Toronto. The 0.281 hectare site is a combination of three distinct parcels of land which are presently occupied by a 1 storey commercial (former Brink’s Express Company of Canada) building, a 3 storey institutional/commercial (former cultural arts facility) building and a parking lot. The proposed redevelopment is for a 14-storey mid-rise condominium building with approximately 184 residential units situated on the south portion of the site and an art gallery within the north portion of the site. The redevelopment will include the transfer of a City-owned easement/laneway which currently divides the site in an east-west direction. The north and south portions of the development are proposed to be connected below grade through the underground parking level of the residential condo.

R.V. Anderson Associates Limited (RVA) has been retained by Delnova Developments Ltd. to prepare a Site Servicing and Stage I Stormwater Management (SWM) Report in support of a zoning amendment application for the proposed site redevelopment.

The scope of this report specifically includes:

- identification and review of existing storm, sanitary and water services available for the site;
- identification of the City of Toronto criteria with respect to sanitary, water and storm servicing including stormwater management;
- investigation of the capacity of existing municipal water and sanitary sewer mains;
- identification and review of other existing buried utilities in the municipal right of way abutting the property;
- estimate water, sanitary and storm demands that will result from the redevelopment;
- provide a preliminary summary of proposed servicing of the site with water, sanitary and storm services; and
- identify a concept stormwater management plan approach to meet the City’s Wet Weather Flow Master Plan Guideline targets.

2.0 BACKGROUND

2.1 Existing Conditions

The Site is located on the west side of McCaul Street, between Stephanie Street and Grange Road (municipal address of 36-60 McCaul Street) in the City of Toronto.

The area surrounding the site is generally characterized by low to medium rise residential buildings, institutional buildings and parkland. Directly to the north of the site is the Ontario College of Art & Design (OCAD).

The existing Site is divided by means of a municipal laneway which traverses the site in the east-west direction. The northern portion of the site is mainly occupied by the existing 1 storey building, with the footprint extending to the perimeter of the site on the west, north and east side. South of the building is a small paved area for existing parking. South of the laneway, the site is mainly occupied by a paved parking lot, with the exception of the three storey building with a relatively small footprint, adjacent to the laneway. Consequently, the site consists entirely of impervious surfaces.

Refer to Figure 1 for a general overview of the site location.

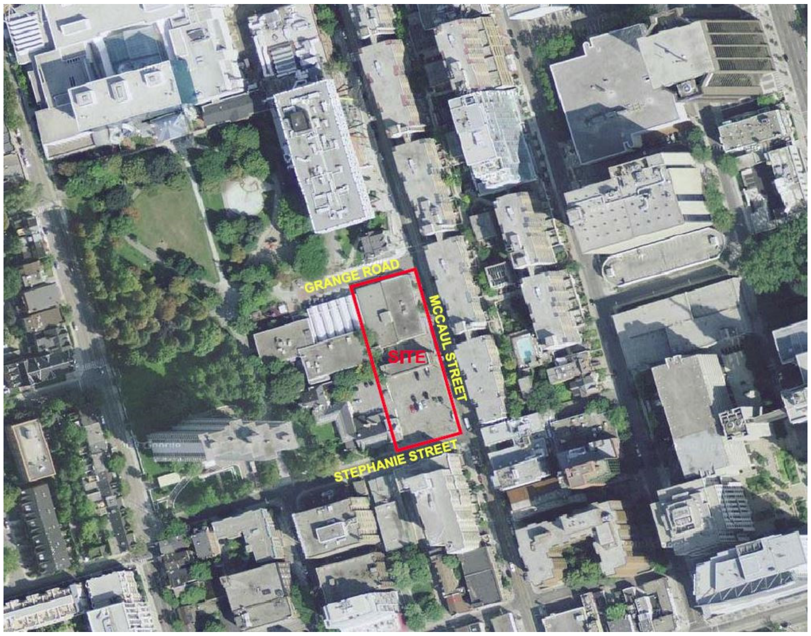


Figure 1 – Site Location

2.2 Proposed Redevelopment

The concept for the 0.281 ha site redevelopment is to construct a new residential condominium mid-rise building approximately 14 stories tall, situated on the south end portion of the site. The condominium will sit atop an underground parking structure.

The north portion of the site will be a proposed 3-storey private art gallery that is intended to be used for the exhibition, collection or preservation of works of art, primarily for private viewing. The lower level of the private art gallery (basement) will be used as a gallery archive with associated laboratory and workspaces. The ground floor will provide office space for the administrative functions of the gallery and the first and second floors will be used as exhibition space, which will extend three levels below grade.

Although it is envisioned that the two distinct halves of the site will be under separate ownership, for the purpose of the stormwater analysis, reference to “The Site” in this report will be in reference to the entire proposed site including both the northern and southern portions.

Based on data provided by Architects Alliance, approximately 184 rental units planned for the residential development. The unit breakdown is comprised of 30 one-bedroom units, 70 one-bedroom + den units, 64 two-bedroom/two-bedroom + den units and 20 three-bedroom/three-bedroom + den units.

There is interior and exterior amenity space which will fall under the same ownership as the residential component of the tower.

Refer to Appendix A – Site Diagram and Project Statistics.

2.3 Background and Resource Information

In preparing this report, the following information was obtained and reviewed:

- Various Plan & Profile Drawings of McCaul Street, Grange Road and Stephanie Street for Sewers and Watermains
- Toronto Water Atlas map of surrounding watermain system, Sheets 651, 652, 653 and 688, Third Edition dated January 9, 2010.
- Toronto Sewer Atlas maps of surrounding storm, sanitary and combined sewer system, Sheets 651, 652, 653 and 688, Third Edition dated January 9, 2010.
- Sketch of Part of Park Lot 13, Concession 1, From The Bay, City of Toronto, prepared by I.M. Pastushak Limited, dated February 22, 2012
- Site Diagram and Project Statistics, provided Architects Alliance
- City of Toronto HVM model data for storm and combined sewers in the immediate vicinity of the site
- Hydrant Flow Tests completed by Jackson Waterworks on May 7, 2013
- A site visit was undertaken on June 11th, 2013. The site visit included a general examination of the property to observe surface features that are representative of underground servicing, current surface drainage and to gather additional relevant information. Photos were taken of the entire site and the perimeter of the site to document its location and current condition.

3.0 SERVICING INVESTIGATION

Information with respect to existing municipal services and utilities was determined from Plan and Profile drawings obtained from the City of Toronto. This information was generally consistent with the location of maintenance hole covers and other physical features observed during the site visit.

3.1 Sanitary Servicing

3.1.1 Sanitary Servicing Criteria

The City of Toronto's Design Criteria for Sewers and Watermains (November 2009) was used to calculate existing and proposed sanitary flows, and is generally summarized as follows:

- Average domestic (residential) sewage flows of 450 litres per capita per day for new developments on new sewers. **
- Average domestic (residential) sewage flows of 240 litres per capita per day for existing developments on existing fully separated sewers. **
- The peak domestic sewage flow to be calculated by utilizing a calculated Harmon Peaking Factor [$M = 1 + 14 / (4+P^{0.5})$].
- Average commercial/industrial/institutional sewage flows of 180,000 litres per floor hectare per day for new local sewers (peaking factor included in average flow).
- A peak infiltration allowance of 0.26 L/s/ha is required for all sewers.
- Population Densities as follows:
    - Townhouses – 2.7 persons per unit
    - 1-Bedroom / 1-Bedroom + Den – 1.4 persons per unit
    - 2-Bedroom – 2.1 persons per unit
    - 3-Bedroom – 3.1 persons per unit

** Notwithstanding the fact that the site is serviced by combined sewers, for the purpose of this report, an average domestic sewage flow of 240 L/cap/day was selected as representative residential flow. It is noted that flow monitoring studies undertaken over the past 10 years have indicated that actual per capita flows are likely less than 240 L/c/day for this type of use.

3.1.2 Existing Conditions

A review of the City's Sewer Atlas Mapping indicates that the site is located in an area of Toronto that is predominantly serviced by both combined and dedicated storm sewers. While combined sewers historically convey both sanitary and storm sewage, over the course of time, they are being transformed into dedicated sanitary sewers, as new storm sewers are constructed and properties are redeveloped. The Sewer Atlas Mapping indicates that there are no dedicated sanitary sewers located within the immediate vicinity of the site.

There are three local combined sewers located within the street municipal streets that front the site: McCaul Street, Grange Road, and Stephanie Street. The following is a description of these sewers. Refer to Appendix E – Plan & Profile Drawings and Atlas Mapping.

There is a 450mm diameter reinforced concrete pipe (RCP) combined sewer that drains from north to south along the McCaul Street frontage of the site. A portion of this sewer was reconstructed in 2012 as part a Capital Works reconstruction project. The sewer was reconstructed at the same depth and location, although previously, the sewer was a vitrified clay pipe (VCP). The reconstructed combined sewer continues south towards Queen Street West, at which point it is directed towards the east and connects into a 600mm diameter brick combined sewer which drains from west to east. The 600mmm diameter brick sewer continues east along Queen Street West until Simcoe Street where it connects to a large 1650mm diameter brick combined sewer that runs from north to south on Simcoe. This sewer continues south on Simcoe until Adelaide Street West where there appears to be a split/weir manhole which conveys partial flow to the City's Mid-Level Interceptor sanitary/combined trunk sewer that drains from west to east along Adelaide. Downstream of this location, the flows continue south on Simcoe until ultimately discharging into the City's Low-Level Interceptor sanitary trunk sewer that runs from west to east along Front Street West at Front Street and Simcoe Street.

There is also an existing 375mm diameter vitrified clay pipe (VCP) combined sewer that drains west to east along the Grange Rd frontage of the site. This sewer connects to the above mentioned 450mm diameter RCP sewer at McCaul Street. As a part of the McCaul Street combined sewer reconstruction project, the last leg of the Grange Rd combined sewer was also reconstructed. The existing sewer was replaced with a 375mm diameter RCP at the same location and depth.

Lastly, there is also an existing 300mm diameter VCP combined sewer that drains from west to east along the Stephanie Street frontage of the site. This sewer also connects to the above mentioned 450mm diameter RCP combined sewer at McCaul Street. Similarly, the last leg of the Stephanie St combined sewer was also reconstructed.

The McCaul Street Combined Sewer Reconstruction plan and profile drawings appear to indicate that The Site has several existing connections to the combined sewer within McCaul Street. Although it is anticipated that some of the connections shown may have been abandoned, there appear to be existing services for each of the two existing buildings; both connected into the 450mm diameter RCP combined sewer along the Queen Street West frontage.

The McCaul Street combined sewer is located generally at a depth of approximately 3.1m to 3.2m below the road surface. The Grange Road combined sewer is located generally at a depth of approximately 3.0m to 3.2m below the road surface. The Stephanie Street combined sewer is located generally at a depth of approximately 2.8 to 3.7 below the road surface.

Currently, the site contains a three-storey institutional and a one-storey commercial building. Therefore, a peak flow of 0.33 L/s was estimated for the existing site use. Refer to Appendix B–Sanitary Servicing Analysis for the existing sanitary flow calculations.

3.1.3 Proposed Sanitary Servicing

The proposed redevelopment will result in an estimated total peak sanitary flow rate of 4.22 L/s, which represents an estimated increase of 3.89 L/s over the current condition. Refer to Appendix B–Sanitary Servicing Analysis for proposed sanitary flow calculations. The estimated breakdown of peak sanitary discharge from the site is as follows:

Table 1 – Estimated Development Sanitary Peak Flow

	AVERAGE FLOW (L/s)	PEAK FLOW (L/s)
RESIDENTIAL	0.94	3.83
ART GALLERY		0.32
INFILTRATION	-	0.07
TOTAL	-	**4.22**

As noted previously, flow monitoring that has been undertaken within the past 10 years has generally indicated that actual dry weather sanitary per capita flow rates are less than the 240 L/c/day flows and therefore the use of a per capita rate of 240 L/c/day is a reasonable approach. The increased use of water conservation type plumbing fixtures will likely continue to influence lower per capita flows.

As required by the City Municipal Code with respect to sewers, a new sanitary service connection will be required for each ownership entity and all existing service connections will be required to be removed. Therefore, as the art gallery and residential portions of the building will be under separate ownership, two sanitary service connections will be required for the redevelopment.

On a preliminary design basis, the existing 375mm diameter VCP/RCP combined sewer located along the Grange Road frontage represents the more desirable connection point for the north portion of the site (future art gallery), due to lower amount of congestion with respect to municipal infrastructure located within Grange Road, as opposed to McCaul Street. Also, due to the recent works conducted on McCaul Street, the City has reserved a short-term moratorium for the road. Although the timeframe of the proposed redevelopment is currently unknown, it would be desirable to avoid as much work as possible within the McCaul right-of-way.

With respect to the south portion of the site (residential building), on a preliminary design basis, the existing 300mm diameter VCP/RCP combined sewer located along the Stephanie Street frontage represents the more desirable connection point. Again, this is both due to the lower amount of congestion with respect to municipal infrastructure located within Stephanie Street, as opposed to McCaul, as well as the temporary moratorium for McCaul.

Based on a review of drawing information obtained from the City, a service connection to the both the existing 375mm diameter VCP/RCP combined sewer on Grange Road and the existing 300mm diameter VCP/RCP combined sewer on Stephanie Street appear to be physically possible, as they are relatively deep enough and there are only small diameter (75-100mm diameter) gas mains to cross under. During the detailed design stage of the project further subsurface utility investigation may be to confirm the location of other unknown buried utilities or existing buried structural building elements if they appear to be in conflict with the proposed service connections.

Refer to the Conceptual Servicing Sketch in Appendix A for the proposed locations of service connections.

3.1.4 Capacity of Existing Sanitary System

The City of Toronto maintains a network model of the sewer systems within the downtown core of the City. This model is referred to as the HVM or Dorsch model. Data from this model for the storm and combined sewers in the vicinity of the site was requested and received from the City's Development Review Department.

As indicated in the previous section, the proposed development would result in an estimated net peak discharge increase of 3.89 L/s. At the proposed location for the sanitary service connections from The Site, the HVM information indicates that the 300mm diameter combined sewer in Stephanie has additional available capacity of 131 L/s and the 375mm diameter combined sewer in Grange has additional available capacity of 112-113 L/s. However, the HVM also indicates that there are pipe segments downstream of this location, towards the Mid-Level Interceptor Sanitary/Combined Trunk Sewer along Adelaide Street West that are operating under theoretical surcharge conditions during wet weather flow. Downstream of the weir/split manhole which diverts southbound flow from the large diameter Simcoe Street combined sewer into the Adelaide Trunk, the HVM model indicates an available capacity of over 1000 L/s within the Simcoe sewer all the way to the Front Trunk. The two sewers segments between The Site and the Adelaide Trunk which are shown to surcharge during wet weather have a total length of approximately 67m.

Notwithstanding the theoretical wet weather surcharge indicated in the HVM Model, the additional flow from The Site is relatively small in comparison to the total flow within the sewer pipes. For example, the first surcharged segment of pipe located downstream of the site has a theoretical free flow capacity of 4464 L/s and an estimated flow through it of 6464 L/s. The additional 3.89 L/s of flow from The Site would theoretically raise the hydraulic grade line (HGL) by approximately 0.4mm (Refer to calculations in Appendix B). The resultant HGL would still be well below the road level (approximately 3.6m).

As mentioned, downstream of this location of surcharging, it is apparent from the HVM model information that there is sufficient capacity for the proposed redevelopment and therefore no further downstream sewer system analysis was conducted.

In addition, it is noted that according to the HVM information, the percentage of storm flows out of total combined flow within the combined sewers on Queen Street West generally ranges between 96% and 97%. Therefore, under dry weather conditions, the combined sewers would have no surcharge at all, based on the HVM model. Therefore, at some point in the future, when dedicated storm sewers are constructed in this area and storm flows are separated from the wastewater flows, we would anticipate that the combined/sanitary surcharging would be eliminated.

Finally, we note that the stormwater management measures that will be employed as part of the redevelopment of The Site, will serve to reduce the demand onto this combined sewer system, as currently runoff from the large storm events are possibly being conveyed uncontrolled into these sewers and the storm discharge from the redevelopment will be reduced in both volume and peak rate.

In conclusion, the HVM/Dorsch model of the City’s combined sewer network indicates that two combined sewers located downstream of the site operate in a surcharged condition. However, the increase in flows from the proposed redevelopment represents a relative small fraction of the total flow conveyed by these sewers. The impact would result in a theoretical increase of the hydraulic grade line by 0.4mm. Due to the relatively large diameter and deep sewers in the municipal right-of-way; a backup of the sanitary sewer connections is not anticipated to be a problem.

Refer to Appendix E – Plan and Profile Drawings and Atlas Mapping, for location of the combined sewers in relation to other utilities.

3.2 Water Servicing

3.2.1 Water Servicing Criteria

The City of Toronto's Design Criteria for Sewers and Watermains (Nov 2009) was used to calculate the proposed water demand, and is generally summarized as follows:

- Water supply systems should be designed to satisfy the greater of peak hour demand or maximum day demand plus fire flow;
- Average domestic water demands of 191 liters per capita per day for low-rise apartment buildings and condominiums with greater than six (6) units.
- Maximum day and peak hour factors for apartments are 1.30 and 2.50 respectively.
- Maximum day and peak hour factors for office/retail are 1.10 and 1.20 respectively.
- Population Densities as follows:
    - Townhouses – 2.7 persons per unit
    - 1-Bedroom / 1-Bedroom + Den – 1.4 persons per unit
    - 2-Bedroom – 2.1 persons per unit
    - 3-Bedroom – 3.1 persons per unit
    - Commercial or retail – 1.1 persons per 100 m^2

3.2.2 Existing Conditions

Three local municipal watermains are located in the vicinity of the site. One 150mm diameter watermain is located along the north side of Grange Road; one 150mm diameter watermain is located on the east side of McCaul Street; and one 150mm diameter watermain is located on the south side of Stephanie Street. The entire watermain network in the area appears to be well interconnected.

There was no information available regarding the location of the existing water/fire services into the two buildings, however, based on the position of the buildings in relation to The Site, it is assumed that the existing services are taken off the 150mm watermain within McCaul Street.

Existing hydrants located in the vicinity of the site are north-east of The Site on the east side of McCaul Street and to the south-west of The Site on the south side of Stephanie Street.

3.2.3 Proposed Water Servicing

Domestic Water Demand Analysis

The total estimated average daily flow rates, maximum day and peak demand rates required for the proposed development are estimated to be as follows:

Table 2 – Estimated Development Water Demand

	AVERAGE DEMAND (L/s)	MAXIMUM DAY DEMAND (L/s)	PEAK HOUR DEMAND (L/s)
RESIDENTIAL	0.75	0.98	1.88
ART GALLERY	0.04	0.04	0.05
TOTAL	0.79	1.02	1.93

Refer to Appendix C – Water Servicing & Fire Flow Analysis

Fire Flow Analysis

Calculations using the Fire Underwriters Survey (FUS) indicate a maximum required fire flow of approximately 100.0 L/s (6,000 L/min) for the residential building and 66.7 L/s (4,000 L/min) for the Art Gallery (based on fire resistive construction with a monitored sprinkler system). Refer to Appendix C - Fire Flow Analysis for detailed calculations.

In accordance with the City of Toronto Design Criteria, fire flows will not be less than 80 L/s (4,800 L/min) for 2-hour duration in addition to the maximum daily domestic demand. This flow is to be delivered with a residual pressure of not less than 140 kPa (20 psi).

As described in section 3.2.1, the water supply system should be designed to satisfy the greater of peak hour demand or maximum day demand plus fire flow. Therefore, as the maximum day demand plus fire flow rate for the residential development and the art gallery is 101.0 L/s (6,059 L/min) and 80.0 L/s (4,802 L/min) respectively, this rate is the governing requirement.

Proposed Watermain Service Connections

In accordance with the City of Toronto Municipal Watermain Code, new domestic water services are required for each ownership entity and all existing services must be removed. As described previously, since the Art Gallery and Residential building will be under separate ownership, two domestic water services will be required. Based on the site layout, it would be preferred to have the domestic connection come off of the Stephanie Street watermain for the residential building and off of the Grange Road watermain for the Archive.

In addition, a fire service is required for each building sprinkler system. As the final proposed building height of approximately 14 stories (plus mechanical) will not exceed 84m in height, only one fire water services would have to be provided for each property, per Ontario Building Code (OBC) 3.2.9.7(4). Consequently, one fire service is proposed to be connected to the Grange Road watermain, while the other to the Stephanie Street watermain, similarly to the domestic water services.

Since the north and south buildings will be linked via the underground structure, there may be an opportunity to employ a single fire suppressant system for both buildings subject to how the buildings are classified under OBC in that regard (i.e. one or two buildings). This option can be explored during the detailed design phase.

The existing hydrants on McCaul street is located roughly at the north-east limit of The Site and the existing hydrant on Stephanie Street is located roughly at the south-west of The Site. These hydrants should serve to satisfy the OBC required coverage to the proposed development; however, this will be evaluated again at the time of detailed design of the redevelopment.

Refer to the Conceptual Servicing Sketch in Appendix A for the proposed locations of service connections. Refer to Appendix E – Plan & Profile Drawings and Atlas Mapping, for location of the watermains in relation to other utilities.

3.2.4 Capacity of Existing Watermain Network

Hydrant flow tests were performed by Jackson Waterworks on behalf of Delnova Developments Ltd. on May 7, 2013. The results of these tests indicate that the existing watermain on the north side of Grange Road and the existing watermain on the south side of Stephanie Street are capable of providing 124 L/s and 179 L/s at 20 psi respectively. Refer to Appendix C- Water Servicing & Fire Flow Analysis for the hydrant flow tests results.

The calculated peak demand as indicated in the previous section is 101.0 L/s for the residential condominium and 80.0 L/s for the Art Gallery. Consequently, both the existing watermain systems on Grange Road and Stephanie Street have sufficient capacity to service the proposed redevelopment.

In conclusion, hydrant flow tests indicate that the existing City watermain network has sufficient capacity to support the subject redevelopment. The domestic and fire service connections for the residential building and the Archive are proposed to be connected to the Stephanie Street and Grange Road watermains respectively.

3.3 Storm Drainage

3.3.1 Storm Drainage Criteria

The City of Toronto Wet Weather Flow Management (WWFM) Guidelines, dated November 2006, identify targets and guidelines for conformance to the City's Wet Weather Flow Management Master Plan (WWFMMP) policy adopted by Council in September of 2003.

The guidelines outline the principals of the WWFMMP, including the management of rainwater and snowmelt where it falls and before it enters the storm sewer, and incorporating a hierarchy approach to Stormwater management (SWM), starting with "at source", then "conveyance" and finally "end-of-pipe" solutions.

Targets identified in the November 2006 guidelines that are applicable to the subject site can be generally summarized as follows:

- Water Balance: Retain stormwater on-site to achieve the same level of pre-development annual runoff and/or, as a minimum, retain 50% of the total average annual rainfall.

- Water Quality: 80% long-term average annual removal of Total Suspended Solids (TSS).

- Water Quantity: Control the 100 year post-development peak discharge rate to the municipal storm sewer to the 2 year peak pre-development rate (with a maximum allowed runoff coefficient of C=0.50)

3.3.2 Existing Conditions

Currently, The Site is completely covered by a combination of existing buildings and parking lots. Consequently, the site can be characterized as entirely impervious surface made up of mainly building rooftops, asphalt and concrete surfaces. The site is currently graded such that the majority of the overland flow would travel from north to south and west to east, towards the McCaul and Stephanie right-of-ways.

The existing building roof drains collect the rainfall and we assume the runoff is discharged from the building's combined sewer service or dedicated storm sewer service. There appear to be no drainage inlets within the existing parking lot in the southern portion of the site. The existing municipal lane to the west appears to drain away from The Site; therefore no surface drainage from neighbouring properties is directed into The Site.

There is one municipal storm sewer located within the frontage of the site in the McCaul Street right-of-way. Along the east side of McCaul Street, a 525mm diameter RCP storm sewer drains from the north towards the south. Just downstream of The Site, the storm sewer increases in diameter to 600mm. At Queen Street West, this storm sewer travels slightly east until Duncan Street, where it continues south until Richmond Street West. At Richmond, the storm sewer continues towards the east, until finally discharging into the same large diameter 1650mm brick combined sewer (described previously in Section 3.2.2) on Simcoe Street.

3.3.3 Proposed Storm Servicing

A detailed (Stage 2) SWM Plan will be prepared to support a proposed Site Plan application. This plan will be comprised of a number of different components that will combine to achieve WWFM Guideline targets summarized conceptually as follows:

Since the existing site is 100% impervious (i.e. runoff coefficient of 0.90), the City's Wet Weather Flow Criteria for peak discharge to a sewer is based on a runoff coefficient of 0.50. Therefore, a redevelopment to City standards would inherently reduce the site's peak discharge to the municipal sewers from its current condition. Based on the City's criteria, the allowed peak discharge rate is 34.5 L/s for the entire site area.

However, due to the nature of the redevelopment, in that there will be a two distinct uses and a potential to possibly sever the site in the future, it is proposed to develop the site with two separate stormwater management systems: one for the residential building within the south portion, and one for the archive within the north portion. Therefore, the allowed peak discharge rate for the residential development is approximately 22.7 L/s and 11.8 L/s for the Art Gallery (Refer to Appendix D for calculations).

The configuration of the proposed redevelopment will result in a below ground parking structure and below grade Art Gallery that will effectively extend to the developable limits of the site. As a result, direct infiltration of runoff into the ground, as a method of addressing the City's water balance requirements is not reasonably possible will likely not be employed.

The adjacent laneway to the west of the site will remain and the site's grading will match to the existing grades along the property line. Area and/or strip drains will be provided on the redevelopment's side of the property to ensure entire containment of surface drainage.

The approach to meeting the City's water balance targets will therefore be to maximize the use of pervious and vegetated surfaces over top of the building structure in order to promote evaporation and transpiration of stormwater. Accordingly, extensive green roofs and vegetative planters will be employed where possible. To supplement these runoff reducing impact of these green surfaces, rainwater harvesting will be employed, likely for irrigation of ground level trees and landscaping or possibly the grey-water uses of amenity areas, and/or an underground parking area weekly wash down facility.

From a water quality perspective for both the residential building and the Art Gallery, the majority of the site surfaces exposed to rain will be roof or terrace surfaces. As roof surfaces of this type do not represent a significant source of sediment/particles, it is felt that the runoff from the roof will inherently meet the City's water quality criteria without any further level of treatment. The ground level impervious surfaces will however require treatment to remove sediment and meet the WWF TSS Removal requirements. This treatment will likely take the form of an oil grit separator(s) or media filtration device(s), however other methods such as the use of permeable unit pavers or utilizing the vegetated landscape areas will be explored. Stormwater treatment units that are employed will have to be located such that surface access is available for maintenance equipment and vacuum trucks.

Since the SWM measures listed above are designed to primarily address water balance and water quality requirements, their “capacities” are somewhat limited to frequent or daily rainfall events which occur over the course of an average year. Although these measures will result in reducing peak discharge rates, they will not likely be sufficient to meet the peak discharge rate requirements of the WWFM Guidelines, for events up to the 100 year design storm. Consequently, a stormwater detention tank will likely be constructed in the underground basement area of the residential building to control the 100 year post development peak discharge rate to that of 2-year storm based on a maximum runoff coefficient of C=0.50. Similarly, some form of detention will be constructed within the underground portion of the Art Gallery. The use of rooftop detention to augment the detention tank will be reviewed during the detailed design stage, pending the extent that green roofs can be employed. Green roof manufacturers will often recommend against employing roof drain flow controls to facilitate roof top detention due to concerns of “floating” the green roof components. The preferred locations of the detention would be as close as possible to the connection to the municipal sewer, therefore along the McCaul frontage. Maintenance access into the tank is required; therefore the tank must be sited accordingly and a suitable arrangement will be determined during the detailed design stage.

It appears that a gravity connection to the McCaul storm sewer is physically possible based on a review of the City’s drawing information; however, as discussed previously with respect to water and sanitary service connections, verification of potential underground utility conflicts will be undertaken as part of the detailed design stage.

In that regard, it is noted that the McCaul Street streetcar tracks will necessitate the installation of a storm connection using tunneling methods. Refer to the Conceptual Servicing Sketch in Appendix A for the proposed locations of service connections.

3.3.4 Municipal Code Consideration

The current City Municipal Code does not allow roof leader connections to municipal storm sewers. Generally, for new developments the measures that must be employed to meet the WWFM targets physically require a storm connection as a means of providing the required controls. The new development SWM plans and proposed measures would then represent the justification for an exemption to the Sewer Code/By-law with respect to storm connections.

As previously mentioned; two separate storm service connections and associated SWM plans for the entire site will be required.

3.3.5 Capacity of Existing Storm Sewer System

Based on the HVM model information, the McCaul Street storm sewers appear to have approximately 208 - 272 L/s of capacity along the frontage of the site. However, the storm sewer system appears to be operating under or near theoretical surcharge conditions at various portions downstream of the site, towards the discharge point into the large diameter 1650mm brick combined sewer within Simcoe Street previously highlighted in the above Sanitary Analysis.

Downstream analysis of the McCaul Street storm sewer reveals that the sewer appears to be alternate between operating under or near theoretical surcharged conditions and operating with theoretical capacity at various locations up until Simcoe Street. As mentioned previously, the peak discharge rate from the entire redevelopment (both the south and north portion) will have to be limited to approximately 34.5 L/s in order to meet the City’s WWFM Guideline target.

Although the original building construction dates are unknown; the McCaul storm sewer was constructed in 1977 according to the City’s plan and profile drawing. This would imply that the site’s storm service connections are to the existing combined sewer. Therefore, the redevelopment would act as a major benefit in that the storm flows would become separated from the combined. Since the existing parking lot located at the south portion of the site does not have any catch basins, uncontrolled runoff from portions of the parking lot would likely enter the McCaul storm sewer for all storm events.

Notwithstanding the existing downstream storm sewer surcharge indicated in the HVM Model, the additional flow from The Site is relatively small in comparison to the total flow within the storm sewer pipes. For example, the first near surcharged segment of pipe located downstream of the site has a theoretical free flow capacity of 516 L/s and an estimated flow through it of 500 L/s. The additional 34.5 L/s of flow from The Site would theoretically raise the hydraulic grade line (HGL) by approximately 49 mm (Refer to calculations in Appendix D). The resultant HGL would still be well below the road level (approximately 2.5m).

In conclusion, the HVM/Dorsch model of the City's storm sewer network indicates that some storm sewers located downstream of the site operate in an existing surcharged or near-surcharged condition. However, the controlled storm flows from the proposed redevelopment would represent a relative small fraction of the total flow conveyed by these sewers. In the event that the existing site storm sewers were previously connected to the combined sewer and thus would now be adding storm flows to the City's storm sewer system, the impact would result in a maximum theoretical increase of the hydraulic grade line by 49mm. Due to the depth of the sewers in the municipal right-of-way; such a surcharge is not anticipated to be a problem. In the event that the existing site storm sewers were already connected to the City's storm sewer system, the redevelopment would provide a positive impact by reducing the total amount of storm flow being contributed to the municipal sewer system.

Refer to Appendix D – Storm Sewer Analysis, for a map of the existing storm sewer system and Appendix E – Plan and Profile Drawings, for location of the storm sewers in relation to other utilities.

3.4 Utilities

As the McCaul Street corridor is a built up area, it was anticipated that it will contain the necessary utilities associated with electrical power supply, street lighting, communications and gas to service the proposed site redevelopment. City plan and profile drawings for the area of the site, in fact, indicate the presence of multiple occurrences of gas, hydro, and Bell infrastructure.

As such, the provision of gas, hydro and communications services for the proposed redevelopment is not anticipated to be a concern.

4.0 CONCLUSION

Sanitary

The proposed development will result in an estimated peak sanitary demand of approximately 4.22 L/s. A review of City's HVM sewer network model, indicates that there are 2 combined sewer segments downstream of the site, totaling 67m in length that operate under surcharge during wet weather. However, the additional flow from the redevelopment will only raise the surcharged HGL of the combined sewer by approximately 0.5mm. A review of the drawing information obtained from the City indicates that a service connection to this sewer is physically possible.

Water

The proposed development will result in an estimated peak water demand of 101.0 L/s (6,059 L/m) comprised of maximum day demand plus fire flow. On the basis of hydrant flow testing performed on May 7, 2013 by Jackson Waterworks, it is concluded that the existing 150mm diameter watermains along both the north side of Grange Road and the south side of Stephanie Street will be able to provide adequate domestic and fire flow for the proposed development.

Storm

In order to meet the requirements of the City's WWFM Guidelines, a detailed (Stage 2) SWM Plan will be developed during the detailed design stage of the project that will incorporate a selection of the following measures:

- Maximize pervious surfaces through the implementation of vegetative planters and green roofs, in order to maximize capture and evapotranspiration of daily runoff.
- Introduce rainwater harvesting for irrigation, grey-water re-use, and/or other issues, to supplement the water balance performance of the vegetative surfaces.
- Construct a SWM detention tank in the basement levels of both the building and the archive to control discharge to the agreed upon allowable release rate for events up to the 100 year design storm.

Due to the nature of the proposed redevelopment and the need to provide on-site storm discharge controls, an exemption to the municipal sewer code will be required and a storm sewer connection will be required to the municipal storm sewer. The existing 525mm diameter storm sewer within the McCaul Street right-of-way fronting the site represents a suitable storm service connection point. The allowable peak discharge rate for the entire site is 34.5 L/s based on the City's WWFM Guideline target for peak discharge. As the existing building on the site drains storm water in an uncontrolled manner to the municipal sewer, the redevelopment will result in a decrease in demand on these sewers, as a result of the SWM controls that will be employed with the redevelopment.

Utilities

Required public utilities, including Bell, gas, and hydro are located within the municipal right-of-way adjacent to the site, in underground locations, and are likely available to service the site.

During the design stage of the project, it is recommended that further investigation be undertaken to confirm the location of buried utilities and buried existing building structural components that may represent physical obstructions to new sanitary, storm or water services for the site.

R. V. ANDERSON ASSOCIATES LIMITED

LICENSED PROFESSIONAL ENGINEER
A. S. TURNER
June 13,'1
PROVINCE OF ONTARIO

Prepared by,
Mauro Russo, B.A.Sc.
Project Designer

Reviewed by,
Andrew S. Turner, P.Eng.
Project Manager, Senior Associate

APPENDIX A

Context Plan/Project Statistics

Roof Plan

Ground Floor Plan

Conceptual Servicing Sketch

2014-06-05

36-60 McCAUL_Rezoning

Toronto, Ontario

All units in metric m2 unless otherwise noted

Zoning	R (f4.5, d2.0) H14
Site Area	**2,813.6** **
Lot Coverage Ratio	**0.53** GCA/Lot Area
Density	**4.76** Excludes Gallery
Average Grade	92.77m
First Floor Grade	92.77m
Loading	**1 - Type 'G' Loading Space**
	1 - Type 'C' Loading Space
Building heights	
Tower	45.65 m
Archive	14.00 m

Proposed Parking Statistics

	Resident Parking Stalls	*Archive Parking*	*Visitor Parking Stalls*	*Non-Compliant Stalls*	Total
Ground Floor					
Parking Level -1	7	0	16	0	*23*
Parking Level -2	37	0	0	0	*37*
Parking Level -3	31	0	0	0	*31*
					0
Total	**75**	**0**	**16**	**0**	**91**
				Total Proposed Parking	**91**

Proposed Amenity Space

Interior Amenity Space	**368** m²
Exterior Amenity Space	**381** m²

Proposed Bicycle Parking

	Resident Lockers	*Resident Bicycle Parking*	*Visitor Bicycle Parking*	
Ground Floor		58	42	*(24 At Grade)*
Parking Level -1		67		
Parking Level -2		44		
Parking Level -3	81			
Total	**81**	**169**	**42**	
Total Proposed Bicycle Parking			**211**	
Total Bicycle Parking+Lockers			250	

Required Parking

(Zoning By-law 438-86)		*(By-Law 569-2013)*	
1 bdrm (0.5x)	50.0	*1 bdrm (0.5x)*	50.0
2 bdrm (0.75x)	48.0	*2 bdrm (0.8x)*	51.2
3 bdrm (1.2x)	24.0	*3 bdrm (1.0x)*	20.0
Total Resident Parking	**122**		**121**
Visitor Parking (0.06x)	**11**		**11**
Total Required Parking	**133**		**132**

Required Amenity Space

Interior Amenity Space	368 m²
Exterior Amenity Space	368 m²

Required Bicycle Parking

Toronto Green Standard *(Zoning Bylaw 569-2013)*		*(Zoning By-law 438-86)*	
Resident (90%)	166	*0.75/Unit @ 80%*	*110*
Visitor (10%)	18	*0.75/Unit @ 20%*	*27.6*
Required Bicycle Parking	**184**		**138**

Area calculation (m²)

Level	*Floor to Floor height*	*No of Floors*	*Condo GCA / Floor*	*Mechanical* / Elevator Shafts*	*Loading*	*Parking Ramp*	*Interior Amenity*	*Exterior Amenity*	*Stairwells*	*Residential GFA (Condo)*	*Res. GFA (Condo) Bylaw 2013*
First Floor Grade 92.77									Bylaw 569/2013	Bylaw 438-86	Bylaw 569/2013
Parking Level -3	3.00	1	1,835.5	1,835.5						0.0	0.0
Parking Level -2	3.00	1	1,835.5	1,835.5						0.0	0.0
Parking Level -1	5.28	1	1,835.5	1,835.5						0.0	0.0
Ground Level 1	2.95	1	991.3	56.5	192.2	222.1	156.1		21.4	364.4	343.0
Mezz (TH Upper)	2.75	1	605.6	41.0			212.1		21.4	352.5	331.1
Level 2	2.95	1	1,126.2	63.8					21.4	1,062.4	1,041.0
Level 3	2.95	1	1,126.2	63.8					21.4	1,062.4	1,041.0
Level 4	2.95	1	1,126.2	63.8					21.4	1,062.4	1,041.0
Levels 5-10	2.95	6	6,757.2	383.1					128.4	6,374.1	6,245.7
Level 11	3.25	1	1,126.2	63.8					21.4	1,062.4	1,041.0
Level 12	3.25	1	769.3	49.6				380.5	21.4	719.7	698.3
Condo Levels 13-14	3.25	2	1,482.4	156.2					21.4	1,326.2	1,304.8
Mechanical PH	5.00	1	465.8	465.8						0.0	0.0
Total		**15**	**15,576.4**	**1,407.5**	**192.2**	**222.1**	**368.2**	**380.5**	**299.6**	**13,386.3**	**13,086.7**
(Above Grade)									*with Gallery:*	**14,934.8**	**14,635.2**
Building Height (Not Incl. MPH)	45.65 M										

**For Typical Unit Floor Mech. Deduction = 4%*

***** Site Area inclusive of the east-west lane currently owned by the City of Toronto, being a portion of PIN 21207-0141(LT)***

Archive Calculations

Level	*Floor to Floor height*	*Gallery GCA / Floor*	*Mechanical Deduction**	*Gallery GFA*	*GCA Total*
First Floor Grade 91.65					
					1,835.5
					1,835.5
Level -1	3.55	770.0	30.8	0.0	*2,605.5*
Ground	4.65	499.0	20.0	479.0	*1,490.3*
		0.0	0.0	0.0	*605.6*
Level 2	3.55	557.0	22.3	534.7	*1,683.2*
Level 3	5.80	557.0	22.3	534.7	*1,683.2*
					1,126.2
					6,757.2
					1,126.2
					769.3
					1,482.4
					465.8
		2,383.0	**64.5**	**1548.5**	***17,189.4***
	14.0 M				

Residential Unit Count

	1 Bedroom	*1 Bedroom+D*	*2 Bedroom / 2 BD + D*	3 Bedroom / 3 BD + D	*Sub-total*
			1	2	**3**
					0
	2	8	6		**16**
	2	8	6		**16**
	2	8	6		**16**
	12	48	36		**96**
	2	8	6		**16**
			1	6	**7**
			2	12	**14**
	20	**80**	**64**	**20**	**184**
AV. Size (M2)	**96.7**	**50.0**	**78.7**	**68.6**	**67.0**

1 BD/ 1BD+D	54.3%
TH/ 2BD	34.8%
3BD	10.9%

Project Statistics

TORONTO City Planning Division

Toronto Green Standard Version 2.0 Statistics Template

For New Mid to High-Rise Residential and All Non-Residential Development

The Toronto Green Standard StatisticsTemplate is submitted with Site Plan Control Applications and stand alone Zoning Bylaw Amendment applications. Complete the table and copy it directly onto the Site Plan submitted as part of the application. Complete **General Project Description and Section 1** for Zoning Bylaw Amendment applications. Complete **General Project Description, Section 1 and Section 2** for Site Plan Control applications. Refer to the full Toronto Green Standard for Mid to High-Rise Residential and All Non-Residential Development for the complete set of standards and detailed specifications: (www.toronto.ca/greendevelopment)

Toronto Green Standard Statistics

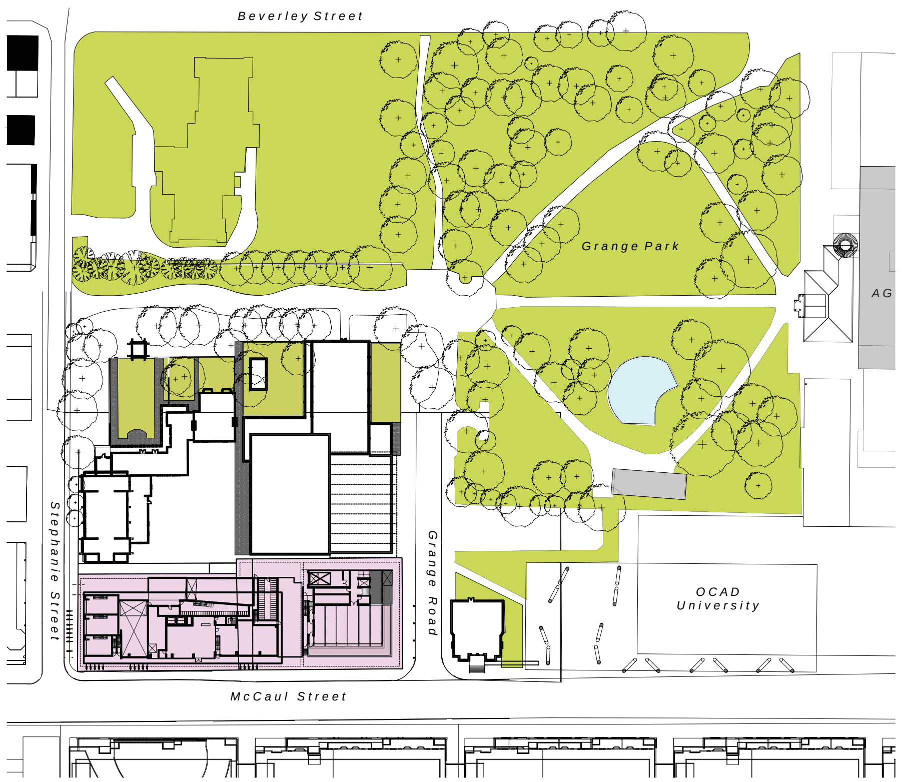
General Project Description	Proposed
Total Gross Floor Area	**14,934.8 m2**
Breakdown of project components:	
Residential	**13,386.3 m2**
Retail	**0**
Commercial	**0**
Industrial	**0**
Institutional/other	**1,548.5 m2**
Total number residential units *(residential only)*	**184**

Section 1: For Stand Alone Zoning Bylaw Amendment Applications and Site Plan Control Applications

Automobile Infrastructure	**Required**	Proposed	%
Number of parking spaces	**78**	**91**	-
Number of parking spaces with physical provision for future EV charging *(residential)*	0	0	0
Number of parking spaces dedicated for priority parking *(institutional/commercial)*	-	-	-
Cycling Infrastructure	**Required**	Proposed	%
Number of long-term bicycle parking spaces *(residential)*	166	169	-
Number of long-term bicycle parking spaces *(all other uses)*	0	0	-
Number of long-term bicycle parking *(residential and all other uses)* located on:			
a) first storey of building	N/A	58	-
b) second storey of building	N/A	0	-
c) first level below-ground (also indicate % of net area of level occupied by bicycle parking)	N/A	56	-
d) second level below-ground (also indicate % of net area of level occupied by bicycle parking)	N/A	44	-
e) other levels below-ground (also indicate % of net area of level occupied by bicycle parking)	N/A	12	-
Number of short-term bicycle parking spaces *(residential only)*	18	18	-
Number of short-term bicycle parking spaces *(all other uses)*	0	0	-
Number of short-term bicycle parking spaces (*residential and all other uses*) at-grade or on first level below grade	18	24	-
Number of male shower and change facilities *(non-residential only)*	0	0	-
Number of female shower and change facilities *(non-residential only)*	0	0	-
Storage and Collection of Recycling and Organic Waste	**Required**	Proposed	%
Waste storage room area (*residential only*) (m²)	56.46	64.25	-

Section 2: For Site Plan Control Applications

Urban Heat Island Reduction: At Grade	**Required**	Proposed	%
Total non-roof hardscape area (m²)			
Total non-roof hardscape area treated for Urban Heat Island **(minimum 50%)** (m²) and (%)			
Percentage of non-roof hardscape treated with:			
a) high-albedo surface material			
b) open-grid pavement			
c) shade from tree canopy			
d) shade from structures covered by solar panels			
Number of surface car parking spaces			
Percentage of parking spaces under cover *(non-residential only)*			
Urban Heat Island Reduction: Roof	**Required**	Proposed	%
Available Roof Space (m²)			
Available Roof Space provided as Green Roof (m²) and (%)			
Available Roof Space provided as Cool Roof (m²) and (%)			
Water Efficiency	**Required**	Proposed	%
Total landscaped site area (m²)			
Landscaped site area planted with drought-tolerant plants **(minimum 50%)** (m²) and (%)			
Urban Forest : Increase Tree Canopy	**Required**	Proposed	%
Total site area (m²)			
Total number of trees planted **(site area x 40% ÷ 66)**			
Number of surface parking spaces			
Number of interior shade trees in surface parking area **(minimum 1 tree for 5 parking spaces)**			
Natural Heritage: Site	**Required**	Proposed	%
Total number of species planted			
Total number of native species planted and % of total species planted **(minimum 50%)**			
Bird Friendly Glazing			%
Total area of glazing of all elevations within 12m above grade (including glass balcony railings)			
Total area of treated glazing (m2 and % of total area of glazing within 12m above grade)			
Percentage of glazing treated with: **(minimum 85%)**			
a) Low reflectance opaque materials			
b) Visual markers			
c) Shading			
Storage and Collection of Recycling and Organic Waste	**Required**	Proposed	%
Waste storage area for bulky items and other (*residential only*)			



CONTEXT PLAN 1:1000

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NO	*ISSUANCE*	*DATE*
#1	*Rezoning Submission*	XX/06/2014

General Notes:

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N

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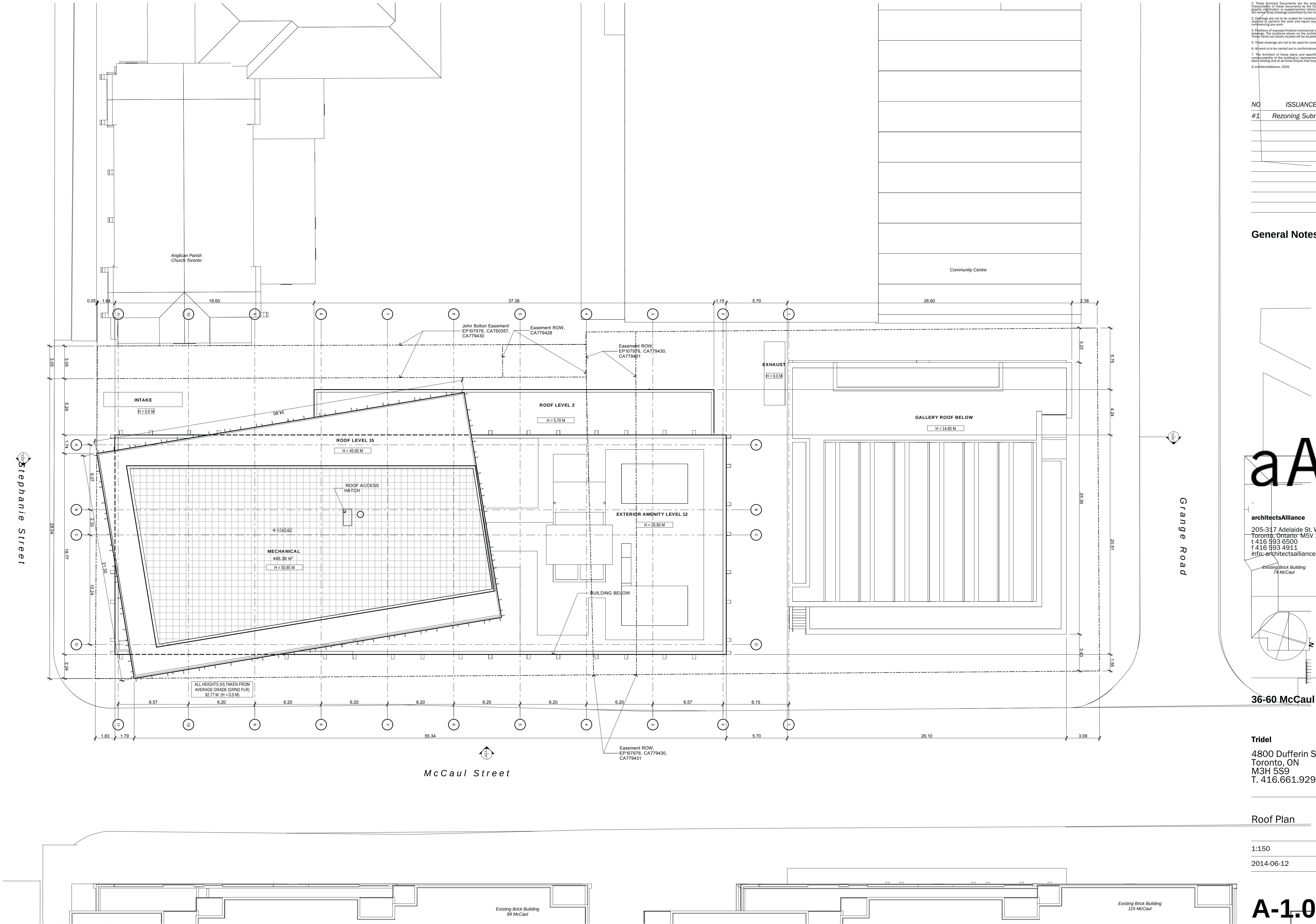
Project Statistics & Context Plan

1:0.54, 1:1000, 1:1 scale

2014-06-12 date of issue

A-1.01



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NO	ISSUANCE	DATE
#1	Rezoning Submission	XX/06/2014

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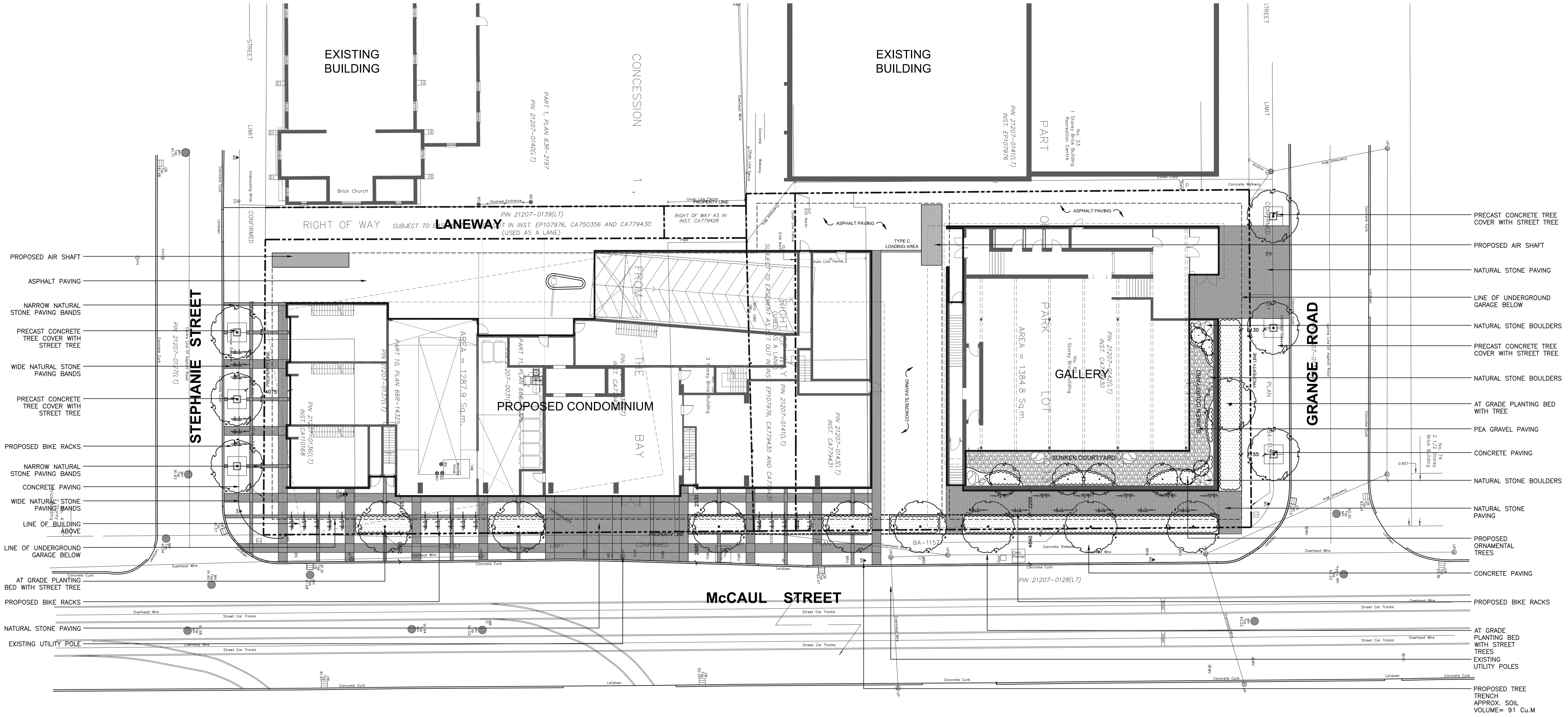
Roof Plan

1:150 scale

2014-06-12 date of issue

A-1.04



NOTE:
NATURAL STONE PAVING BANDS ARE TO ALIGN & REFLECT THE ARCHITECTURAL BANDING ON THE BUILDING FACADE

Section 1: For Stand Alone Zoning Bylaw Amendment Applications and Site Plan Control Applications

Automobile Infrastructure	**Required**	Proposed	%
Number of parking spaces	**78**	**78**	-
Number of parking spaces with physical provision for future EV charging *(residential)*	0	0	0
Number of parking spaces dedicated for priority parking *(institutional'commercial)*	-	-	-
Cycling Infrastructure	**Required**	Proposed	%
Number of long-term bicycle parking spaces *(residential)*	154	131	-
Number of long-term bicycle parking spaces *(all other uses)*	0	0	-
Number of long-term bicycle parking *(residential and all other uses)* located on:			
a) first storey of building	N/A	0	-
b) second storey of building	N/A	0	-
c) first level below-ground (also indicate % of net area of level occupied by bicycle parking)	N/A	43	-
d) second level below-ground (also indicate % of net area of level occupied by bicycle parking)	N/A	44	-
e) other levels below-ground (also indicate % of net area of level occupied by bicycle parking)	N/A	44	-
Number of short-term bicycle parking spaces *(residential only)*	18	0	-
Number of short-term bicycle parking spaces *(all other uses)*	0	0	-
Number of short-term bicycle parking spaces (*residential and all other uses*) at-grade or on first level below grade	18	0	-
Number of male shower and change facilities *(non-residential only)*	0	0	-
Number of female shower and change facilities *(non-residential only)*	0	0	-
Storage and Collection of Recycling and Organic Waste	**Required**	Proposed	%
Waste storage room area (*residential only*) (m^2)	56.46	XX	-

Key Plan

NOTE:
This drawing, as an instrument of service, is provided by The MBTW Group. The contractor shall check and verify all dimensions and report all error and omissions, to the Landscape Architect whose seal is affixed to this drawing, before proceeding with the work. This drawing is not to be scaled. All dimensions are in millimeters unless otherwise noted. Stake out all utilities prior to commencing work.

Legend

▬ ▪ ▪ ▬	PROPERTY LINE
◯	PROPOSED DECIDUOUS TREE
◯	PROPOSED MULTI–STEM DECIDUOUS SPECIMEN SHRUB
▨	PROPOSED SHRUB, PERENNIAL & GROUNDCOVER PLANTING BEDS c/w MULCH
▤	PROPOSED PRECAST CONCRETE UNIT PAVERS
▩	PROPOSED NATURAL STONE PAVING
◯	PROPOSED NATURAL STONE BOULDERS
⊣⊢	PROPOSED BIKE RACK

No	Date	Revisions	By
1.	JUNE 11/2014	Issued for ZBA	CKA

TRIDEL
BUILDERS INC

Designed By
Checked By

Project Name
36-60 McCaul STREET
Condominium
Toronto, Ontario

Municipality
City of Toronto

Sheet Title
Ground Level
Landscape Plan

The MBTW Group

Community Planning
Urban Design
Landscape Architecture

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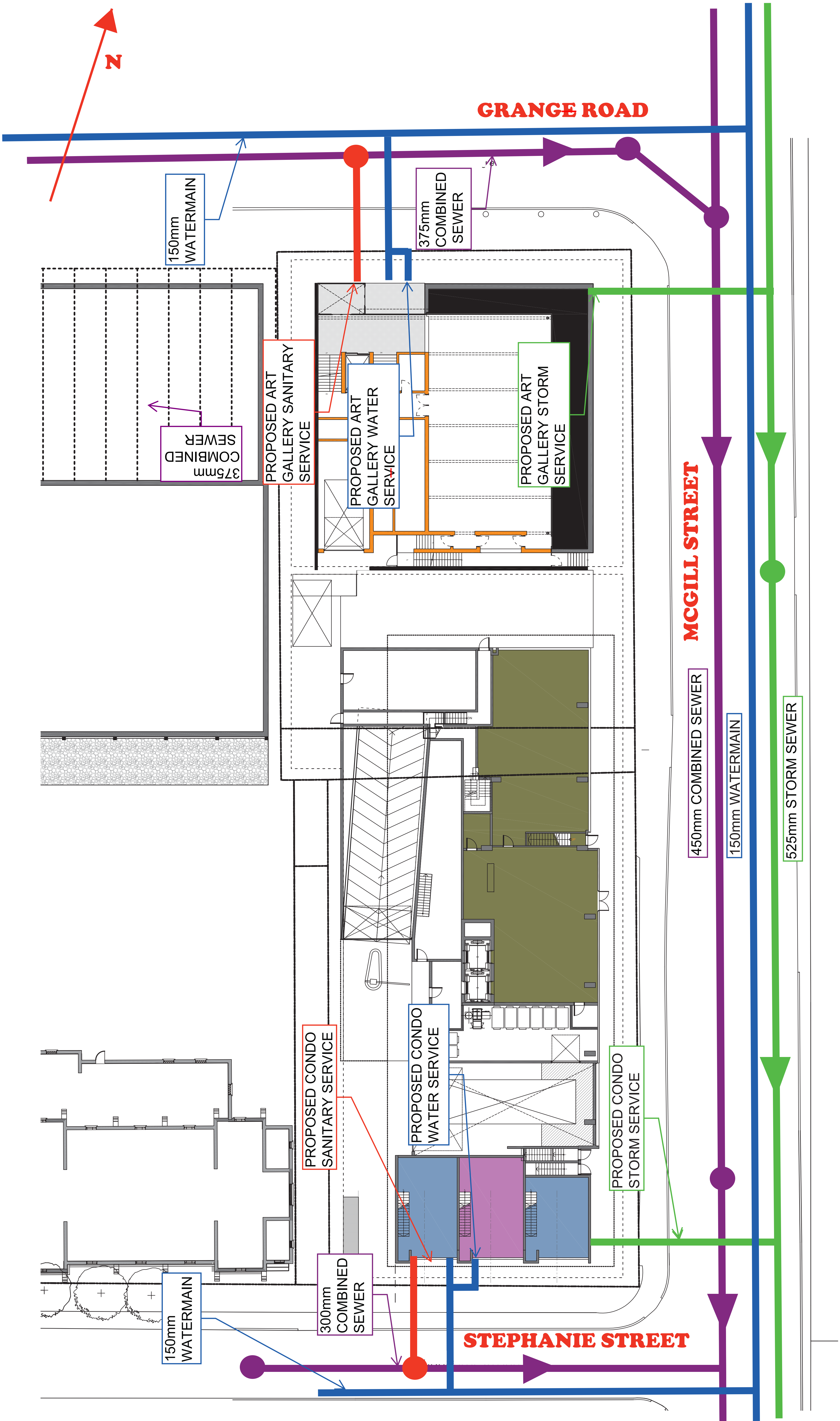
Job No: TRI169
Designed: CKA
Drawn: JW/MH
Date: March, 2014
Scale: 1:200
Drawing No.: L-1a


N
GRANGE ROAD
150mm WATERMAIN
375mm COMBINED SEWER
375mm COMBINED SEWER
PROPOSED ART GALLERY SANITARY SERVICE
PROPOSED ART GALLERY WATER SERVICE
PROPOSED ART GALLERY STORM SERVICE
MCGILL STREET
450mm COMBINED SEWER
150mm WATERMAIN
525mm STORM SEWER
PROPOSED CONDO SANITARY SERVICE
PROPOSED CONDO WATER SERVICE
PROPOSED CONDO STORM SERVICE
300mm COMBINED SEWER
150mm WATERMAIN
STEPHANIE STREET

CONCEPTUAL SERVICING SKETCH
JUNE 2014

APPENDIX B

Sanitary Servicing Analysis

TABLE B1 - PROPOSED TOTAL SANITARY FLOW ESTIMATE - RESIDENTIAL (450 L/c/d)

			TOTAL
1.1	Total Townhouse Units	units	0
1.2	Persons Per Unit*	persons/unit	2.7
2.1	Total One Bedroom + Den Units	units	100
2.2	Persons Per Unit*	persons/unit	1.4
3.1	Total Two Bedroom Units	units	64
3.2	Persons Per Unit*	persons/unit	2.1
4.1	Total Three Bedroom Units	units	20
4.2	Persons Per Unit*	persons/unit	3.1
5.1	Total Residential Population	persons	336
5.2	Total Population Used for Calculation Purposes**	persons	340
6.1	Total Residential Flow @ 450 L/person/day*	L/day	153,000
6.2	Total Residential Flow	L/s	1.77
6.3	Peaking Factor***		4.05
7.1	**Total Residential Peak Flow**	**L/s**	**7.18**

* as per City of Toronto Design Criteria for Sewers and Watermains - Nov.2009.

** The population was rounded to 340 persons to provide a conservative figure for demand calculations.

*** Peaking Factor calculated by using Harmon's Formula (1+ 14/(4 + P^0.5)).

TABLE B2 - PROPOSED TOTAL SANITARY FLOW ESTIMATE - RESIDENTIAL (240 L/c/d)

		TOTAL
1.1 Total Townhouse Units	units	0
1.2 Persons Per Unit*	persons/unit	2.7
2.1 Total One Bedroom + Den Units	units	100
2.2 Persons Per Unit*	persons/unit	1.4
3.1 Total Two Bedroom Units	units	64
3.2 Persons Per Unit*	persons/unit	2.1
4.1 Total Three Bedroom Units	units	20
4.2 Persons Per Unit*	persons/unit	3.1
5.1 Total Residential Population	persons	336
5.2 Total Population Used for Calculation Purposes**	persons	340
6.1 Total Residential Flow @ 240 L/person/day*	L/day	81,600
6.2 Total Residential Flow	L/s	0.94
6.3 Peaking Factor***		4.05
7.1 **Total Residential Peak Flow**	**L/s**	**3.83**

* as per City of Toronto Design Criteria for Sewers and Watermains - Nov.2009.

** The population was rounded to 340 persons to provide a conservative figure for demand calculations.

*** Peaking Factor calculated by using Harmon's Formula (1+ 14/(4 + P^0.5)).

TABLE B3 - PROPOSED TOTAL SANITARY FLOW ESTIMATE - ART GALLERY

			Total
1.1	Total Art Gallery Floor Area	m^2	1,544
1.2	Total Art Gallery Floor Area	ha	0.1544
2.1	Total Art Gallery Flow @ 180 000 litres/floor hectares/day*	L/day	27,783
2.2	Total Art Gallery Flow	L/s	0.32
3.1	**Total Art Gallery Peak Flow**	**L/s**	**0.32**

* as per City of Toronto Design Criteria for Sewers and Watermains - Nov.2009.

TABLE B4 - PROPOSED TOTAL SANITARY FLOW ESTIMATE - INFILTRATION

1.1	Site Area*	m^2	2814
1.2	Site Area	ha	0.2814
2.1	Infiltration Allowance**	L/s/ha	0.26
3.1	**Total Infiltration Peak Flow**	L/s	**0.07**

* Entire Site Area

** as per City of Toronto Design Criteria for Sewers and Watermains - Nov.2009.

TABLE B5 - PROPOSED TOTAL SANITARY FLOW ESTIMATE - SUMMARY (450 L/c/d)

			TOTAL
1.1	Total Residential Peak Flow	L/s	7.18
1.2	Total Art Gallery Peak Flow	L/s	0.32
1.3	Total Infiltration Peak Flow	L/s	0.07
2.1	**Total Sanitary Peak Flow**	**L/s**	**7.57**

TABLE B6 - PROPOSED TOTAL SANITARY FLOW ESTIMATE - SUMMARY (240 L/c/d)

			TOTAL
1.1	Total Residential Peak Flow	L/s	3.83
1.2	Total Art Gallery Peak Flow	L/s	0.32
1.3	Total Infiltration Peak Flow	L/s	0.07
2.1	**Total Sanitary Peak Flow**	**L/s**	**4.22**

TABLE B7 - EXISTING TOTAL SANITARY FLOW ESTIMATE - COMMERCIAL/INSTITUTIONAL

			Total
1.1	Total Commercial/institutional Floor Area*	m^2	1,607
1.2	Total Commercial/Institutional Floor Area	ha	0.16
2.1	Total Flow @ 180 000 litres/floor hectares/day**	L/day	28,923
2.2	Total Commercial/Institutional Average Flow	L/s	0.33
3.1	**Total Commercial/Institutional Peak Flow**	**L/s**	**0.33**

* Total area estimated based on topographic survey.

** as per City of Toronto Design Criteria for Sewers and Watermains - Nov.2009.

TABLE B8 - PROPOSED REDEVELOPMENT TOTAL NET SANITARY INCREASE (450 L/c/d)

		Total
1.1 Total Existing Sanitary Peak Flow	L/s	0.33
1.2 Total Redevelopment Sanitary Peak Flow	L/s	7.57
2.1 **Total Net Sanitary Peak Flow Increase**	**L/s**	**7.24**

TABLE B9 - PROPOSED REDEVELOPMENT TOTAL NET SANITARY INCREASE (240 L/c/d)

		Total
1.1 Total Existing Sanitary Peak Flow	L/s	0.33
1.2 Total Redevelopment Sanitary Peak Flow	L/s	4.22
2.1 **Total Net Sanitary Peak Flow Increase**	**L/s**	**3.89**

ESTIMATED HYDRAULIC GRADE LINE IMPACT OF DESIGN FLOW

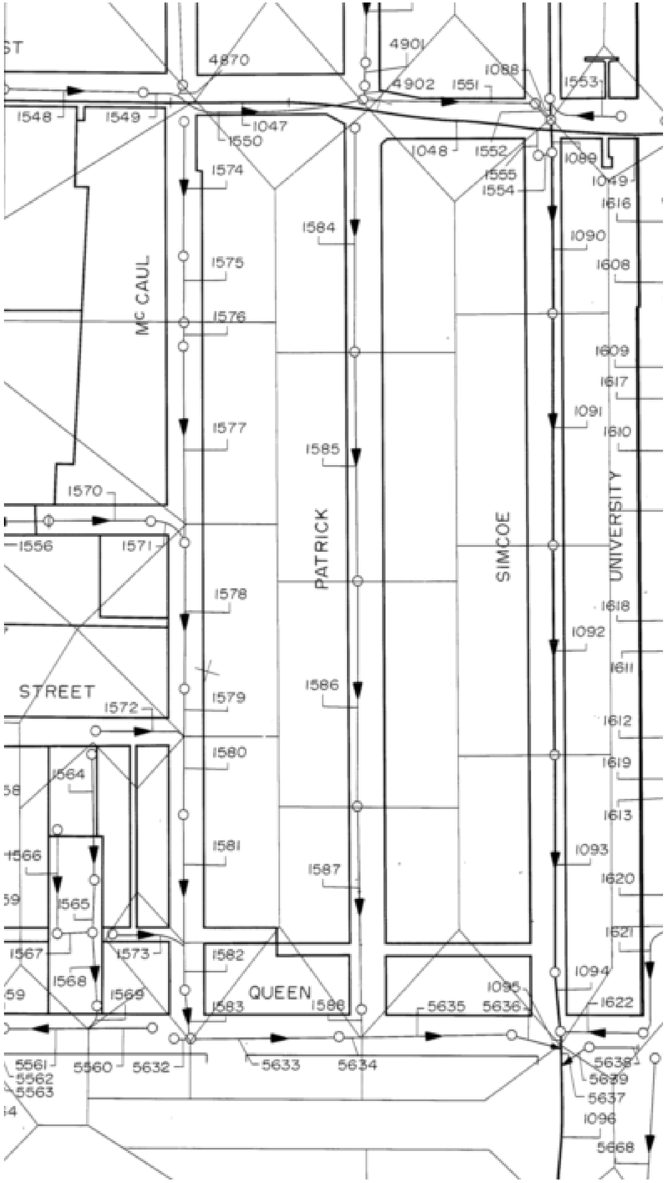
Surcharged Pipe Segment	HVM Diameter (mm)	HVM Lengh (m)	HVM Slope (%)	HVM Capacity (L/s)	HVM Total Flow (L/s)	Theoretical Slope of HGL based on Velocity Head (%)	Total Flow with Development Flow Added (L/s)	Theoretical Slope of HGL based on Velocity Head with Development Flow Added (%)	Difference in Slope (%)	Increase in HGL (m)
1110	1600	36.6	0.284	4464	6464	0.5927	6468	0.5933	0.00	0.0002
1111	1600	30.5	0.210	3836	6536	0.6060	6540	0.6066	0.00	0.0002

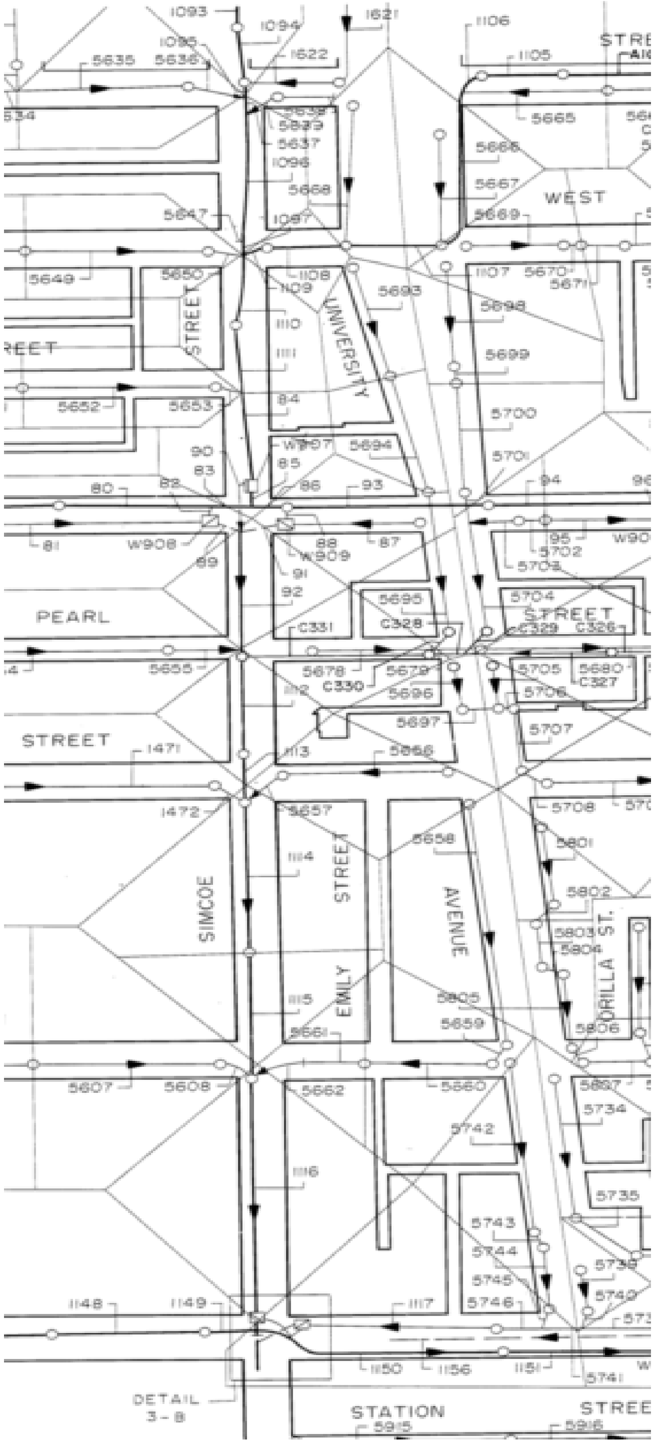
TOTAL INCREASE IN HGL (m) = 0.0004

60 McCaul St (DC7 – 1, 3 (Simcoe))

Please note that the HVM information provided to you is for information purposes only. It may not be accurate, complete, or up-to-date. Therefore, please take any steps you deem necessary to confirm the actual flow and capacity of the subject sewers in the vicinity of the subject site.

Combined Sewers




1093
1094
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1106
STRE
1095
1622
1105
5635
5636
5634
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5665
1096
5666
5667
WEST
5668
5647
1097
5669
5649
5650
1108
1107
5670
5671
1109
5693
5698
STREET
1110
UNIVERSITY
REET
1111
5699
5652
5653
84
5700
W907
5694
90
85
5701
83
80
82
86
93
94
81
W908
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87
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5702
W909
89
91
5703
92
5695
5704
PEARL
C328
STREET
C331
C329
C326
5655
5678
5679
5705
5680
C330
C327
1112
5696
5706
5697
5707
STREET
1471
1113
5666
1472
5657
5708
5658
5801
1114
STREET
SIMCOE
AVENUE
5802
5803
ORILLA ST.
5804
EMILY
1115
5805
5659
5806
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1116
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5743
5744
5745
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1117
1150
1156
1151
5741
DETAIL
3-8
STATION
STREE
5915
5916

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   80  CIRCULAR         1.98/1.98  INFLOW    79              OUTFLOW    83         B.NO.   3400                 EXIST. COMB.     80
0      YU  79.434  YL  79.394   QF  3562   DQ       0   QDLM 1438  VNIGHT0.08   DUC   1.95   DLC   1.94    QLM     4926   CAP   -1363
       SU  87.103  SL  87.264   AF 3.074   DQD    0.0   HDLM 1.23  HNIGHT1.19   DUS  -3.74   DLS  -3.95                  QLM/QF 1.38
+                                                                                                          RAIN   7MS2
       RES     15  A     0.0    VF  1.16   GAMMA 0.0    VDLM 0.72  VNORM 1.10   HUM   3.93   HLM   3.92    QRQLM  3805   DY      0.04
       IW     0.0  L     68.9   S                       SCOD 400   DWB   0.35   YUM  83.36   YLM  83.32    VLM     1.60   DH      0.00
+                                 1/1722   N   0.0130
0
   81  CIRCULAR         0.30/0.30  INFLOW                     OUTFLOW  W908         B.NO.   3400                 EXIST. COMB.     81
0   *  YU  83.537  YL  82.546   QF    86   DQ     220   QDLM    0  VNIGHT0.19   DUC   0.90   DLC   0.60    QLM      211   CAP    -125
       SU  87.215  SL  87.264   AF 0.071   DQD    0.1   HDLM 0.01  HNIGHT0.00   DUS  -2.48   DLS  -3.81                  QLM/QF 2.47
+                                                                                                          RAIN   7MS2
       RES     15  A     0.79   VF  1.21   GAMMA 0.99   VDLM 0.25  VNORM 0.0    HUM   1.20   HLM   0.90    QRQLM   211   DY      0.99
       IW     0.0  L    125.6   S                       SCOD  15   DWB   0.0    YUM  84.73   YLM  83.45    VLM     2.99   DH      0.29
+                                 1/ 127   N   0.0130
0
   82  CIRCULAR         0.23/0.23  INFLOW  W908               OUTFLOW    83         B.NO.   3400                 EXIST. COMB.     82
0   *  YU  82.500  YL  82.479   QF    56   DQ       0   QDLM    0  VNIGHT0.21   DUC   0.63   DLC   0.61    QLM      104   CAP     -47
       SU  87.264  SL  87.264   AF 0.041   DQD    0.0   HDLM 0.01  HNIGHT0.00   DUS  -3.91   DLS  -3.95                  QLM/QF 1.85
+                                                                                                          RAIN   7MS2
       RES     15  A     0.0    VF  1.35   GAMMA 0.99   VDLM 0.31  VNORM 0.0    HUM   0.86   HLM   0.84    QRQLM   104   DY      0.02
       IW     0.0  L      1.5   S                       SCOD  15   DWB   0.0    YUM  83.36   YLM  83.32    VLM     2.50   DH      0.02
+                                 1/  71   N   0.0130
0
   83  CIRCULAR         2.13/2.13  INFLOW    80   82          OUTFLOW    86         B.NO.   3400                 EXIST. COMB.     83
0      YU  79.394  YL  79.318   QF 14730   DQ       0   QDLM 1438  VNIGHT0.07   DUC   1.80   DLC   1.87    QLM     4926   CAP    9804
       SU  87.264  SL  87.325   AF 3.557   DQD    0.0   HDLM 1.30  HNIGHT1.26   DUS  -3.94   DLS  -4.01                  QLM/QF 0.33
+                                                                                                          RAIN   7MS2
       RES     15  A     0.0    VF  4.14   GAMMA 0.99   VDLM 0.63  VNORM 2.69   HUM   3.93   HLM   4.00    QRQLM  3791   DY      0.08
       IW     0.0  L     11.3   S                       SCOD  15   DWB   0.86   YUM  83.32   YLM  83.31    VLM     1.38   DH     -0.07
+                                 1/ 149   N   0.0130
0
   84  CIRCULAR         1.60/1.60  INFLOW  1111  5653         OUTFLOW  W907         B.NO. 706900  PASSING ON    EXIST. COMB.     84
0   *  YU  82.936  YL  82.186   QF  9788   DQ     100   QDLM  222  VNIGHT1.10   DUC  -0.10   DLC   0.30    QLM     6692   CAP    3096
       SU  87.974  SL  87.411   AF 2.007   DQD    0.0   HDLM 0.17  HNIGHT0.05   DUS  -3.54   DLS  -3.33                  QLM/QF 0.68
+                                                                                                          RAIN   7MS2
       RES      0  A     0.36   VF  4.88   GAMMA 0.99   VDLM 2.09  VNORM 0.0    HUM   1.50   HLM   1.90    QRQLM  6441   DY      0.75
       IW     0.0  L     54.9   S                       SCOD  15   DWB   0.00   YUM  84.43   YLM  84.08    VLM     3.33   DH     -0.40
+                                 1/  73   N   0.0130
0
   85  CIRCULAR         0.46/0.46  INFLOW  W907               OUTFLOW    86         B.NO. 716900                 EXIST. COMB.     85
0   *  YU  81.760  YL  80.406   QF   783   DQ       0   QDLM  222  VNIGHT0.35   DUC   1.51   DLC   2.43    QLM      818   CAP     -35
       SU  87.411  SL  87.325   AF 0.166   DQD    0.0   HDLM 0.21  HNIGHT0.18   DUS  -3.68   DLS  -4.02                  QLM/QF 1.05
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  4.72   GAMMA 0.99   VDLM 2.92  VNORM 4.09   HUM   1.97   HLM   2.89    QRQLM   588   DY      1.35
       IW     0.0  L     20.1   S                       SCOD  15   DWB   0.05   YUM  83.73   YLM  83.30    VLM     4.93   DH     -0.92
+                                 1/  15   N   0.0130
0
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   86  CIRCULAR          2.13/2.13  INFLOW    83    85         OUTFLOW    93         B.NO.   3300                EXIST. COMB.     86
0      YU  79.318  YL  79.312   QF  4252   DQ       0   QDLM 1659  VNIGHT0.08   DUC   1.85   DLC   1.85    QLM    5353   CAP   -1100
       SU  87.325  SL  87.325   AF 3.557   DQD    0.0   HDLM 1.31  HNIGHT1.27   DUS  -4.02   DLS  -4.03                  QLM/QF 1.26
+                                                                                                          RAIN   7MS2
       RES      15  A      0.0    VF  1.20   GAMMA 0.99   VDLM 0.73  VNORM 1.13   HUM   3.98   HLM   3.98    QRQLM  4188   DY      0.01
       IW     0.0  L      10.7   S                       SCOD  15   DWB   0.38   YUM  83.30   YLM  83.29    VLM    1.50   DH    -0.00
+                                 1/1784   N   0.0130
0
   87  CIRCULAR          0.30/0.30  INFLOW                     OUTFLOW  W909         B.NO.   3300                EXIST. COMB.     87
0   *  YU  82.653  YL  82.293   QF    75   DQ     103   QDLM    0  VNIGHT0.16   DUC   0.42   DLC   0.70    QLM      93   CAP     -17
       SU  86.898  SL  87.325   AF 0.071   DQD    0.1   HDLM 0.01  HNIGHT0.00   DUS  -3.52   DLS  -4.03                  QLM/QF 1.24
+                                                                                                          RAIN   7MS2
       RES      15  A      0.37   VF  1.06   GAMMA 0.99   VDLM 0.18  VNORM 0.0    HUM   0.72   HLM   1.00    QRQLM    93   DY      0.36
       IW     0.0  L      60.1   S                       SCOD  15   DWB   0.0    YUM  83.38   YLM  83.30    VLM    1.31   DH    -0.28
+                                 1/ 167   N   0.0130
0
   88  CIRCULAR          0.30/0.30  INFLOW  W909               OUTFLOW    93         B.NO.   3300                EXIST. COMB.     88
0   *  YU  82.217  YL  82.205   QF    86   DQ       0   QDLM    0  VNIGHT0.19   DUC   0.77   DLC   0.81    QLM      83   CAP       3
       SU  87.325  SL  87.325   AF 0.071   DQD    0.0   HDLM 0.01  HNIGHT0.00   DUS  -4.03   DLS  -4.01                  QLM/QF 0.96
+                                                                                                          RAIN   7MS2
       RES      15  A      0.0    VF  1.22   GAMMA 0.99   VDLM 0.19  VNORM 0.0    HUM   1.07   HLM   1.11    QRQLM    83   DY      0.01
       IW     0.0  L       1.5   S                       SCOD  15   DWB   0.0    YUM  83.29   YLM  83.32    VLM    1.31   DH    -0.04
+                                 1/ 125   N   0.0130
0
   89  CIRCULAR          0.30/0.30  INFLOW  W908               OUTFLOW    92         B.NO.   3400                EXIST. STORM     89
0   *  YU  82.546  YL  82.464   QF    72   DQ       0   QDLM    0  VNIGHT0.0    DUC   0.57   DLC   0.49    QLM      96   CAP     -22
       SU  87.264  SL  87.234   AF 0.071   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -3.85   DLS  -3.98                  QLM/QF 1.32
+                                                                                                          RAIN   7MS2
       RES       0  A      0.0    VF  1.02   GAMMA 0.99   VDLM 0.0   VNORM 0.0    HUM   0.87   HLM   0.79    QRQLM    96   DY      0.08
       IW     0.0  L      14.6   S                       SCOD  15   DWB   0.0    YUM  83.41   YLM  83.26    VLM    1.36   DH     0.07
+                                 1/ 178   N   0.0130
0
   90  CIRCULAR          1.60/1.60  INFLOW  W907               OUTFLOW    92         B.NO. 716900                EXIST. STORM     90
0   *  YU  82.159  YL  82.067   QF  6038   DQ       0   QDLM    0  VNIGHT0.0    DUC   0.01   DLC   0.0     QLM    6190   CAP    -151
       SU  87.411  SL  87.234   AF 2.007   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -3.65   DLS  -3.57                  QLM/QF 1.03
+                                                                                                          RAIN   7MS2
       RES       0  A      0.0    VF  3.01   GAMMA 0.99   VDLM 0.0   VNORM 0.0    HUM   1.61   HLM   1.60    QRQLM  5955   DY      0.09
       IW     0.0  L      17.7   S                       SCOD  15   DWB   0.0    YUM  83.76   YLM  83.67    VLM    3.23   DH     0.01
+                                 1/ 192   N   0.0130
0
   91  CIRCULAR          0.30/0.30  INFLOW  W909               OUTFLOW    92         B.NO.   3300                EXIST. STORM     91
0   *  YU  82.293  YL  82.235   QF    61   DQ       0   QDLM    0  VNIGHT0.0    DUC   0.68   DLC   0.69    QLM      63   CAP       0
       SU  87.234  SL  87.234   AF 0.071   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -3.96   DLS  -4.01                  QLM/QF 1.02
+                                                                                                          RAIN   7MS2
       RES       0  A      0.0    VF  0.87   GAMMA 0.99   VDLM 0.0   VNORM 0.0    HUM   0.98   HLM   0.99    QRQLM    63   DY      0.06
       IW     0.0  L      14.3   S                       SCOD  15   DWB   0.0    YUM  83.27   YLM  83.22    VLM    0.89   DH    -0.00
+                                 1/ 247   N   0.0130
0
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   92  CIRCULAR         1.60/1.60  INFLOW    89    90    91   OUTFLOW  1112         B.NO. 716800               EXIST. COMB.     92
0      YU  82.067  YL  80.955   QF 10663   DQ       0   QDLM    0  VNIGHT0.0    DUC  -0.71   DLC  -0.71    QLM    6278     CAP    4384
       SU  87.234  SL  86.719   AF 2.007   DQD    0.0   HDLM 0.00  HNIGHT0.00   DUS  -4.27   DLS  -4.88                     QLM/QF 0.59
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  5.31   GAMMA 0.99   VDLM 0.0   VNORM 0.0    HUM   0.89   HLM   0.89    QRQLM  6042     DY     1.11
       IW     0.0  L     68.6   S                       SCOD  15   DWB   0.00   YUM  82.96   YLM  81.84    VLM    5.49     DH     0.01
+                            1/  62   N   0.0130
0
 1090  CIRCULAR         1.30/1.30  INFLOW  1089               OUTFLOW  1091         B.NO. 717210               EXIST. COMB.   1090
0      YU  89.389  YL  88.362   QF  5407   DQ     134   QDLM   37  VNIGHT0.64   DUC  -0.85   DLC  -0.83    QLM    1491     CAP    3917
       SU  94.244  SL  93.391   AF 1.325   DQD    0.5   HDLM 0.07  HNIGHT0.00   DUS  -4.41   DLS  -4.56                     QLM/QF 0.28
+                                                                                                          RAIN   7MS2
       RES     79  A     0.58   VF  4.08   GAMMA 0.78   VDLM 1.27  VNORM 0.0    HUM   0.45   HLM   0.47    QRQLM  1451     DY     1.03
       IW     0.0  L     81.4   S                       SCOD   4   DWB   0.00   YUM  89.84   YLM  88.83    VLM    3.48     DH    -0.02
+                            1/  79   N   0.0130
0
 1091  CIRCULAR         1.30/1.30  INFLOW  1090               OUTFLOW  1092         B.NO. 717210               EXIST. COMB.   1091
0      YU  88.362  YL  86.962   QF  5252   DQ     179   QDLM   38  VNIGHT0.62   DUC  -0.83   DLC  -0.80    QLM    1619     CAP    3634
       SU  93.391  SL  92.226   AF 1.325   DQD    0.7   HDLM 0.07  HNIGHT0.00   DUS  -4.56   DLS  -4.76                     QLM/QF 0.31
+                                                                                                          RAIN   7MS2
       RES     79  A     0.80   VF  3.96   GAMMA 0.78   VDLM 1.25  VNORM 0.0    HUM   0.47   HLM   0.50    QRQLM  1586     DY     1.40
       IW     0.0  L    117.6   S                       SCOD  15   DWB   0.00   YUM  88.83   YLM  87.46    VLM    3.48     DH    -0.03
+                            1/  84   N   0.0130
0
 1092  CIRCULAR         1.30/1.30  INFLOW  1091               OUTFLOW  1093         B.NO. 717210               EXIST. COMB.   1092
0      YU  86.962  YL  85.695   QF  5188   DQ     172   QDLM   39  VNIGHT0.61   DUC  -0.80   DLC  -0.78    QLM    1743     CAP    3444
       SU  92.226  SL  91.166   AF 1.325   DQD    0.7   HDLM 0.08  HNIGHT0.00   DUS  -4.76   DLS  -4.95                     QLM/QF 0.34
+                                                                                                          RAIN   7MS2
       RES     79  A     0.77   VF  3.92   GAMMA 0.78   VDLM 1.24  VNORM 0.0    HUM   0.50   HLM   0.52    QRQLM  1708     DY     1.27
       IW     0.0  L    109.1   S                       SCOD  15   DWB   0.0    YUM  87.46   YLM  86.21    VLM    3.55     DH    -0.02
+                            1/  86   N   0.0130
0
 1093  CIRCULAR         1.37/1.37  INFLOW  1092               OUTFLOW  1094         B.NO. 717210               EXIST. COMB.   1093
0      YU  85.618  YL  84.527   QF  5638   DQ     204   QDLM   39  VNIGHT0.60   DUC  -0.85   DLC  -0.33    QLM    1805     CAP    3833
       SU  91.166  SL  90.108   AF 1.472   DQD    0.8   HDLM 0.08  HNIGHT0.00   DUS  -5.03   DLS  -4.54                     QLM/QF 0.32
+                                                                                                          RAIN   7MS2
       RES     79  A     0.91   VF  3.83   GAMMA 0.78   VDLM 1.20  VNORM 0.0    HUM   0.52   HLM   1.04    QRQLM  1767     DY     1.09
       IW     0.0  L    105.2   S                       SCOD  15   DWB   0.0    YUM  86.14   YLM  85.57    VLM    2.65     DH    -0.52
+                            1/  96   N   0.0130
0
 1094  CIRCULAR         1.45/1.45  INFLOW  1093               OUTFLOW  1095         B.NO. 717200               EXIST. COMB.   1094
0   *  YU  84.451  YL  84.332   QF  4245   DQ       0   QDLM   39  VNIGHT0.03   DUC  -0.33   DLC  -0.24    QLM    1756     CAP    2489
       SU  90.108  SL  89.901   AF 1.649   DQD    0.0   HDLM 0.13  HNIGHT0.04   DUS  -4.54   DLS  -4.36                     QLM/QF 0.41
+                                                                                                          RAIN   7MS2
       RES     79  A     0.0    VF  2.58   GAMMA 0.70   VDLM 0.54  VNORM 0.87   HUM   1.12   HLM   1.21    QRQLM  1717     DY     0.12
       IW     0.0  L     27.4   S                       SCOD  15   DWB   0.04   YUM  85.57   YLM  85.54    VLM    1.84     DH    -0.09
+                            1/ 230   N   0.0130
0
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 1095  CIRCULAR          1.60/1.60  INFLOW  1094  1622         OUTFLOW  5637         B.NO. 717200                EXIST. COMB.   1095
0      YU  84.332  YL  84.207   QF  8089   DQ        0   QDLM  119  VNIGHT0.76   DUC  -0.43   DLC  -0.32    QLM    2970   CAP    5119
       SU  89.901  SL  90.071   AF 2.007   DQD    0.0   HDLM 0.14  HNIGHT0.04   DUS  -4.39   DLS  -4.59                  QLM/QF 0.37
+                                                                                                          RAIN   7MS2
       RES     79  A     0.0    VF  4.03   GAMMA 0.70   VDLM 1.53  VNORM 0.0    HUM   1.17   HLM   1.28    QRQLM  2854   DY      0.13
       IW     0.0  L     13.4   S                       SCOD  15   DWB   0.00   YUM  85.51   YLM  85.48    VLM    2.55   DH     -0.10
+                                 1/ 107   N   0.0130
0
 1096  CIRCULAR          1.60/1.60  INFLOW  5637  5639  5643   OUTFLOW  1097         B.NO. 717100                EXIST. COMB.   1096
0      YU  84.180  YL  83.515   QF  7988   DQ      120   QDLM  124  VNIGHT0.77   DUC  -0.32   DLC   0.18    QLM    3894   CAP    4093
       SU  90.038  SL  88.880   AF 2.007   DQD    0.0   HDLM 0.13  HNIGHT0.04   DUS  -4.58   DLS  -3.58                  QLM/QF 0.49
+                                                                                                          RAIN   7MS2
       RES      0  A     0.41   VF  3.98   GAMMA 1.00   VDLM 1.54  VNORM 0.0    HUM   1.28   HLM   1.78    QRQLM  3771   DY      0.66
       IW     0.0  L     73.1   S                       SCOD 102   DWB   0.0    YUM  85.46   YLM  85.30    VLM    2.92   DH     -0.51
+                                 1/ 110   N   0.0130
0
 1097  CIRCULAR          1.60/1.60  INFLOW  1096  5647         OUTFLOW  1110         B.NO. 717100                EXIST. COMB.   1097
0   *  YU  83.515  YL  83.119   QF 17470   DQ        0   QDLM  124  VNIGHT0.29   DUC   0.13   DLC   0.50    QLM    4383   CAP   13087
       SU  88.880  SL  88.788   AF 2.007   DQD    0.0   HDLM 0.24  HNIGHT0.07   DUS  -3.63   DLS  -3.57                  QLM/QF 0.25
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  8.70   GAMMA 1.00   VDLM 0.67  VNORM 2.73   HUM   1.73   HLM   2.10    QRQLM  4259   DY      0.40
       IW     0.0  L      9.1   S                       SCOD 102   DWB   0.15   YUM  85.25   YLM  85.22    VLM    2.18   DH     -0.37
+                                 1/  23   N   0.0130
0
 1098  CIRCULAR          0.99/0.99  INFLOW  1636  1631         OUTFLOW  1099         B.NO. 145215                EXIST. COMB.   1098
0   *  YU  86.606  YL  86.505   QF  1716   DQ        0   QDLM   34  VNIGHT0.51   DUC   1.36   DLC   1.40    QLM    1281   CAP     435
       SU  91.437  SL  91.336   AF 0.768   DQD    0.0   HDLM 0.09  HNIGHT0.03   DUS  -2.48   DLS  -2.44                  QLM/QF 0.75
+                                                                                                          RAIN   7MS2
       RES     17  A     0.0    VF  2.23   GAMMA 0.67   VDLM 0.93  VNORM 0.0    HUM   2.35   HLM   2.39    QRQLM  1219   DY      0.10
       IW     0.0  L     18.6   S                       SCOD  15   DWB   0.0    YUM  88.95   YLM  88.90    VLM    1.76   DH     -0.04
+                                 1/ 184   N   0.0130
0
1108  CIRCULAR          0.99/0.99  INFLOW  1107  5668         OUTFLOW  1109         B.NO. 653300                EXIST. COMB.   1108
0      YU  83.710  YL  83.485   QF  1841   DQ       47   QDLM   89  VNIGHT0.70   DUC   0.76   DLC   0.72    QLM    2023   CAP    -182
       SU  88.666  SL  88.788   AF 0.768   DQD    0.0   HDLM 0.14  HNIGHT0.05   DUS  -3.20   DLS  -3.59                  QLM/QF 1.10
+                                                                                                          RAIN   7MS2
       RES      0  A     0.17   VF  2.40   GAMMA 0.99   VDLM 1.28  VNORM 0.0    HUM   1.75   HLM   1.71    QRQLM  1914   DY      0.23
       IW     0.0  L     36.0   S                       SCOD  15   DWB   0.0    YUM  85.46   YLM  85.19    VLM    2.63   DH      0.04
+                                 1/ 160   N   0.0130
0
 1109  CIRCULAR          0.99/0.99  INFLOW  1108               OUTFLOW  1110         B.NO. 653300                EXIST. COMB.   1109
0   *  YU  83.476  YL  83.412   QF  1776   DQ        0   QDLM   89  VNIGHT0.68   DUC   0.73   DLC   0.71    QLM    2023   CAP    -247
       SU  88.788  SL  88.788   AF 0.768   DQD    0.0   HDLM 0.15  HNIGHT0.05   DUS  -3.59   DLS  -3.68                  QLM/QF 1.14
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  2.31   GAMMA 0.99   VDLM 1.25  VNORM 0.0    HUM   1.72   HLM   1.70    QRQLM  1914   DY      0.06
       IW     0.0  L     11.0   S                       SCOD  15   DWB   0.0    YUM  85.19   YLM  85.11    VLM    2.63   DH      0.02
+                                 1/ 172   N   0.0130




0
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 1110  CIRCULAR          1.60/1.60  INFLOW  1097  1109  5650   OUTFLOW  1111         B.NO. 717000                EXIST. COMB.   1110
0      YU  83.119  YL  83.015   QF  4464   DQ       0   QDLM  221  VNIGHT0.62   DUC   0.22   DLC   0.10    QLM    6464   CAP    -1999
       SU  88.788  SL  88.173   AF 2.007   DQD    0.0   HDLM 0.24  HNIGHT0.07   DUS  -3.85   DLS  -3.45                  QLM/QF 1.45
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  2.22   GAMMA 0.99   VDLM 1.20  VNORM 0.0    HUM   1.82   HLM   1.70    QRQLM  6220   DY      0.10
       IW     0.0  L     36.6   S                       SCOD  15   DWB   0.00   YUM  84.94   YLM  84.72    VLM    3.22   DH      0.11
+                                 1/ 352   N   0.0130
0
 1111  CIRCULAR          1.60/1.60  INFLOW  1110                 OUTFLOW    84         B.NO. 717000                EXIST. COMB.   1111
0      YU  83.000  YL  82.936   QF  3836   DQ      92   QDLM  221  VNIGHT0.56   DUC   0.12   DLC   0.0     QLM    6536   CAP    -2699
       SU  88.173  SL  87.974   AF 2.007   DQD    0.0   HDLM 0.26  HNIGHT0.08   DUS  -3.45   DLS  -3.44                  QLM/QF 1.70
+                                                                                                          RAIN   7MS2
       RES      0  A     0.33   VF  1.91   GAMMA 0.99   VDLM 1.07  VNORM 0.0    HUM   1.72   HLM   1.60    QRQLM  6288   DY      0.06
       IW     0.0  L     30.5   S                       SCOD  15   DWB   0.0    YUM  84.72   YLM  84.54    VLM    3.26   DH      0.12
+                                 1/ 477   N   0.0130
0
 1112  CIRCULAR          1.60/1.60  INFLOW    92  5655  C331   OUTFLOW  1113         B.NO. 167                   EXIST. COMB.   1112
0      YU  80.955  YL  79.906   QF 11749   DQ      86   QDLM    5  VNIGHT0.91   DUC  -0.74   DLC  -0.31    QLM    6604   CAP     5145
       SU  86.585  SL  85.551   AF 2.007   DQD    4.8   HDLM 0.03  HNIGHT0.00   DUS  -4.77   DLS  -4.35                  QLM/QF 0.56
+                                                                                                          RAIN   7MS2
       RES      0  A     0.29   VF  5.85   GAMMA 0.99   VDLM 0.91  VNORM 0.0    HUM   0.86   HLM   1.29    QRQLM  6356   DY      1.05
       IW     4.8  L     53.3   S                       SCOD  15   DWB   0.01   YUM  81.82   YLM  81.20    VLM    4.41   DH     -0.43
+                                 1/  51   N   0.0130
0
 1113  CIRCULAR          1.60/1.60  INFLOW  1112                 OUTFLOW  1114         B.NO. 716700                EXIST. COMB.   1113
0      YU  79.906  YL  79.681   QF  8195   DQ       0   QDLM    5  VNIGHT0.64   DUC  -0.31   DLC  -0.24    QLM    6569   CAP     1625
       SU  85.551  SL  85.451   AF 2.007   DQD    0.0   HDLM 0.06  HNIGHT0.02   DUS  -4.35   DLS  -4.41                  QLM/QF 0.80
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  4.08   GAMMA 0.99   VDLM 0.18  VNORM 0.64   HUM   1.29   HLM   1.36    QRQLM  6320   DY      0.23
       IW     0.0  L     23.5   S                       SCOD  15   DWB   0.04   YUM  81.20   YLM  81.04    VLM    4.39   DH     -0.06
+                                 1/ 104   N   0.0130
0
 1114  CIRCULAR          1.68/1.68  INFLOW  1113  1472  5657   OUTFLOW  1115         B.NO. 716600                EXIST. COMB.   1114
0      YU  79.681  YL  78.248   QF 12451   DQ     187   QDLM   39  VNIGHT0.88   DUC  -0.32   DLC   0.56    QLM    7945   CAP     4506
       SU  85.451  SL  84.097   AF 2.213   DQD    0.0   HDLM 0.07  HNIGHT0.02   DUS  -4.41   DLS  -3.61                  QLM/QF 0.64
+                                                                                                          RAIN   7MS2
       RES      0  A     0.81   VF  5.63   GAMMA 0.81   VDLM 1.38  VNORM 0.0    HUM   1.36   HLM   2.24    QRQLM  7639   DY      1.43
       IW     0.0  L     84.1   S                       SCOD  15   DWB   0.01   YUM  81.04   YLM  80.49    VLM    4.38   DH     -0.88
+                                 1/  59   N   0.0130
0
 1115  CIRCULAR          1.68/1.68  INFLOW  1114                 OUTFLOW  1116         B.NO. 716600                EXIST. COMB.   1115
0      YU  78.248  YL  77.633   QF  8934   DQ      90   QDLM   39  VNIGHT0.63   DUC   0.56   DLC   0.70    QLM    7789   CAP     1145
       SU  84.097  SL  83.064   AF 2.213   DQD    0.0   HDLM 0.07  HNIGHT0.02   DUS  -3.61   DLS  -3.05                  QLM/QF 0.87
+                                                                                                          RAIN   7MS2
       RES      0  A     0.39   VF  4.04   GAMMA 0.81   VDLM 1.10  VNORM 0.0    HUM   2.24   HLM   2.38    QRQLM  7518   DY      0.62
       IW     0.0  L     70.1   S                       SCOD  15   DWB   0.0    YUM  80.49   YLM  80.02    VLM    4.28   DH     -0.14
+                                 1/ 114   N   0.0130
0
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 1116  CIRCULAR          1.83/1.83  INFLOW  1115  5608  5662   OUTFLOW  W905         B.NO. 716500                EXIST. COMB.   1116
0   *  YU  77.480  YL  76.227   QF 11518   DQ     172   QDLM   40  VNIGHT0.68   DUC   0.71   DLC   1.29    QLM    8428   CAP    3089
       SU  83.064  SL  80.967   AF 2.626   DQD    0.0   HDLM 0.08  HNIGHT0.03   DUS  -3.05   DLS  -1.62                  QLM/QF 0.73
+                                                                                                          RAIN   7MS2
       RES      0  A     0.97   VF  4.39   GAMMA 0.62   VDLM 1.11  VNORM 0.0    HUM   2.54   HLM   3.12    QRQLM  8148   DY      1.25
       IW     0.0  L    135.6   S                       SCOD  15   DWB   0.01   YUM  80.02   YLM  79.34    VLM    3.21   DH     -0.58
+                                 1/ 108   N   0.0130
0
1148  EGG               0.97/1.45  INFLOW  1147               OUTFLOW  1149         B.NO. 312400                EXIST. COMB.   1148
0      YU  74.892  YL  74.813   QF  1204   DQ       0   QDLM  167  VNIGHT0.49   DUC   2.84   DLC   2.88    QLM    1057   CAP     147
       SU  81.397  SL  81.199   AF 1.072   DQD    0.0   HDLM 0.44  HNIGHT0.14   DUS  -2.22   DLS  -2.05                  QLM/QF 0.88
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  1.12   GAMMA 0.0    VDLM 0.73  VNORM 0.84   HUM   4.29   HLM   4.33    QRQLM  1000   DY      0.08
       IW     0.0  L     67.7   S                       SCOD 400   DWB   0.04   YUM  79.18   YLM  79.15    VLM    0.99   DH     -0.05
+                                 1/ 857   N   0.0130
0
 1149  EGG               0.97/1.45  INFLOW  1148               OUTFLOW  1150         B.NO. 312400                EXIST. COMB.   1149
0      YU  74.813  YL  74.792   QF  1010   DQ       0   QDLM  167  VNIGHT0.43   DUC   2.89   DLC   2.89    QLM    1057   CAP     -46
       SU  81.199  SL  81.037   AF 1.072   DQD    0.0   HDLM 0.44  HNIGHT0.14   DUS  -2.05   DLS  -1.90                  QLM/QF 1.05
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  0.94   GAMMA 0.0    VDLM 0.73  VNORM 0.0    HUM   4.34   HLM   4.34    QRQLM  1000   DY      0.02
       IW     0.0  L     25.6   S                       SCOD 400   DWB   0.0    YUM  79.15   YLM  79.14    VLM    0.99   DH     -0.01
+                                 1/1219   N   0.0130
0
 1150  EGG               1.07/1.60  INFLOW  1149  1118  1119   OUTFLOW  1151         B.NO. 312300                EXIST. COMB.   1150
0      YU  74.685  YL  74.578   QF  1460   DQ       0   QDLM  207  VNIGHT0.37   DUC   2.84   DLC   2.90    QLM    1065   CAP     395
       SU  81.037  SL  80.787   AF 1.305   DQD    0.0   HDLM 0.44  HNIGHT0.17   DUS  -1.91   DLS  -1.71                  QLM/QF 0.73
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  1.12   GAMMA 0.0    VDLM 0.84  VNORM 0.0    HUM   4.44   HLM   4.50    QRQLM  1008   DY      0.11
       IW     0.0  L    105.5   S                       SCOD 400   DWB   0.0    YUM  79.13   YLM  79.08    VLM    1.09   DH     -0.05
+                                 1/ 986   N   0.0130
0
 1151  EGG               1.07/1.60  INFLOW  1150               OUTFLOW  1157         B.NO. 312200                EXIST. COMB.   1151
0      YU  74.578  YL  74.466   QF  1529   DQ       0   QDLM  207  VNIGHT0.19   DUC   2.90   DLC   2.96    QLM    1065   CAP     465
       SU  80.787  SL  80.495   AF 1.305   DQD    0.0   HDLM 0.43  HNIGHT0.28   DUS  -1.71   DLS  -1.47                  QLM/QF 0.70
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  1.17   GAMMA 0.0    VDLM 0.87  VNORM 0.0    HUM   4.50   HLM   4.56    QRQLM  1007   DY      0.11
       IW     0.0  L    100.6   S                       SCOD 400   DWB   0.0    YUM  79.08   YLM  79.02    VLM    1.11   DH     -0.06
+                                 1/ 898   N   0.0130
0
1574  CIRCULAR          0.46/0.46  INFLOW                     OUTFLOW  1575         B.NO. 522200                EXIST. COMB.   1574
0      YU  91.708  YL  91.114   QF   291   DQ       0   QDLM    0  VNIGHT0.0    DUC  -0.46   DLC  -0.46    QLM       0   CAP     291
       SU  95.274  SL  94.726   AF 0.166   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -3.57   DLS  -3.61                  QLM/QF 0.0
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  1.76   GAMMA 1.00   VDLM 0.0   VNORM 0.0    HUM   0.0    HLM   0.00    QRQLM     0   DY      0.59
       IW     0.0  L     63.7   S                       SCOD 102   DWB   0.0    YUM  91.71   YLM  91.12    VLM    0.0    DH     -0.00
+                                 1/ 107   N   0.0130
0
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 1575  CIRCULAR          0.46/0.46  INFLOW  1574              OUTFLOW  1576        B.NO. 522200                EXIST. COMB.   1575
0      YU  91.077  YL  90.696   QF   276   DQ      15   QDLM    0  VNIGHT0.26   DUC  -0.42   DLC  -0.39    QLM       14  CAP     262
       SU  94.726  SL  94.323   AF 0.166   DQD    0.4   HDLM 0.01  HNIGHT0.00   DUS  -3.61   DLS  -3.56                  QLM/QF 0.05
+                                                                                                          RAIN   7MS2
       RES    765  A     0.05   VF  1.66   GAMMA 1.00   VDLM 0.35  VNORM 0.0    HUM   0.04   HLM   0.07    QRQLM    14  DY      0.38
       IW     0.0  L     45.4   S                       SCOD 102   DWB   0.0    YUM  91.12   YLM  90.77    VLM     0.90  DH     -0.03
+                                 1/ 119   N   0.0130
0
 1576  CIRCULAR          0.46/0.46  INFLOW  1575              OUTFLOW  1577        B.NO. 522200                EXIST. COMB.   1576
0      YU  90.660  YL  90.626   QF   181   DQ       0   QDLM    0  VNIGHT0.17   DUC  -0.37   DLC  -0.38    QLM       14  CAP     167
       SU  94.323  SL  94.217   AF 0.166   DQD    0.0   HDLM 0.01  HNIGHT0.00   DUS  -3.58   DLS  -3.51                  QLM/QF 0.08
+                                                                                                          RAIN   7MS2
       RES      2  A     0.0    VF  1.09   GAMMA 1.00   VDLM 0.25  VNORM 0.0    HUM   0.09   HLM   0.08    QRQLM    13  DY      0.03
       IW     0.0  L      9.4   S                       SCOD 102   DWB   0.0    YUM  90.75   YLM  90.71    VLM     0.66  DH      0.00
+                                 1/ 278   N   0.0130
0
 1577  CIRCULAR          0.46/0.46  INFLOW  1576              OUTFLOW  1578        B.NO. 522200                EXIST. COMB.   1577
0      YU  90.593  YL  89.660   QF   296   DQ      18   QDLM    1  VNIGHT0.28   DUC  -0.39   DLC  -0.37    QLM       27  CAP     268
       SU  94.217  SL  93.217   AF 0.166   DQD    0.4   HDLM 0.02  HNIGHT0.00   DUS  -3.55   DLS  -3.46                  QLM/QF 0.09
+                                                                                                          RAIN   7MS2
       RES    585  A     0.06   VF  1.78   GAMMA 1.00   VDLM 0.43  VNORM 0.0    HUM   0.07   HLM   0.09    QRQLM    27  DY      0.93
       IW     0.0  L     96.9   S                       SCOD 102   DWB   0.0    YUM  90.66   YLM  89.75    VLM     1.14  DH     -0.02
+                                 1/ 104   N   0.0130
0
 1578  CIRCULAR          0.46/0.46  INFLOW  1577  1571        OUTFLOW  1579        B.NO. 522100                EXIST. COMB.   1578
0      YU  89.651  YL  88.377   QF   397   DQ       0   QDLM    1  VNIGHT0.37   DUC  -0.37   DLC  -0.37    QLM       33  CAP     364
       SU  93.217  SL  92.022   AF 0.166   DQD    0.0   HDLM 0.02  HNIGHT0.00   DUS  -3.48   DLS  -3.56                  QLM/QF 0.08
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  2.39   GAMMA 1.00   VDLM 0.56  VNORM 0.0    HUM   0.09   HLM   0.09    QRQLM    32  DY      1.27
       IW     0.0  L     73.5   S                       SCOD 102   DWB   0.0    YUM  89.74   YLM  88.47    VLM     1.46  DH      0.00
+                                 1/  58   N   0.0130
0
 1579  CIRCULAR          0.46/0.46  INFLOW  1578              OUTFLOW  1580        B.NO. 522100                EXIST. COMB.   1579
0      YU  88.334  YL  87.478   QF   482   DQ      10   QDLM    1  VNIGHT0.45   DUC  -0.38   DLC  -0.28    QLM       41  CAP     441
       SU  92.022  SL  91.516   AF 0.166   DQD    0.3   HDLM 0.02  HNIGHT0.01   DUS  -3.61   DLS  -3.86                  QLM/QF 0.09
+                                                                                                          RAIN   7MS2
       RES    735  A     0.03   VF  2.90   GAMMA 1.00   VDLM 0.69  VNORM 0.0    HUM   0.08   HLM   0.18    QRQLM    40  DY      0.86
       IW     0.0  L     33.5   S                       SCOD 102   DWB   0.01   YUM  88.42   YLM  87.66    VLM     0.84  DH     -0.10
+                                 1/  39   N   0.0130
0
 1580  CIRCULAR          0.46/0.46  INFLOW  1579  1572        OUTFLOW  1581        B.NO. 522000                EXIST. COMB.   1580
0      YU  87.478  YL  87.222   QF   267   DQ       0   QDLM    1  VNIGHT0.25   DUC  -0.28   DLC  -0.28    QLM       82  CAP     185
       SU  91.516  SL  90.977   AF 0.166   DQD    0.0   HDLM 0.02  HNIGHT0.01   DUS  -3.86   DLS  -3.58                  QLM/QF 0.31
+                                                                                                          RAIN   7MS2
       RES     32  A     0.0    VF  1.61   GAMMA 1.00   VDLM 0.46  VNORM 0.0    HUM   0.18   HLM   0.18    QRQLM    81  DY      0.26
       IW     0.0  L     32.6   S                       SCOD 102   DWB   0.0    YUM  87.66   YLM  87.40    VLM     1.43  DH      0.00
+                                 1/ 127   N   0.0130
0
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 1581  CIRCULAR          0.46/0.46  INFLOW  1580               OUTFLOW  1582         B.NO. 522000                EXIST. COMB.   1581
0      YU  87.222  YL  86.563   QF   294   DQ      32   QDLM    2  VNIGHT0.28   DUC  -0.29   DLC  -0.27    QLM     107   CAP     186
       SU  90.977  SL  90.068   AF 0.166   DQD    0.2   HDLM 0.02  HNIGHT0.01   DUS  -3.58   DLS  -3.31                  QLM/QF 0.37
+                                                                                                          RAIN   7MS2
       RES    195  A      0.11   VF  1.77   GAMMA 1.00   VDLM 0.52  VNORM 0.0    HUM   0.17   HLM   0.19    QRQLM   105   DY      0.66
       IW     0.0  L      69.5   S                      SCOD 102   DWB   0.0    YUM  87.39   YLM  86.76    VLM    1.63   DH    -0.02
+                                 1/ 105   N   0.0130
0
 1582  CIRCULAR          0.46/0.46  INFLOW  1581  1573         OUTFLOW  1583         B.NO. 521900                EXIST. COMB.   1582
0      YU  86.563  YL  86.289   QF   326   DQ      14   QDLM    2  VNIGHT0.31   DUC  -0.28   DLC  -0.20    QLM     118   CAP     208
       SU  90.068  SL  89.718   AF 0.166   DQD    0.1   HDLM 0.02  HNIGHT0.01   DUS  -3.32   DLS  -3.17                  QLM/QF 0.36
+                                                                                                          RAIN   7MS2
       RES    196  A      0.05   VF  1.96   GAMMA 1.00   VDLM 0.57  VNORM 0.0    HUM   0.18   HLM   0.26    QRQLM   116   DY      0.27
       IW     0.0  L      23.5   S                      SCOD 102   DWB   0.0    YUM  86.75   YLM  86.55    VLM    1.35   DH    -0.08
+                                 1/  86   N   0.0130
0
 1583  CIRCULAR          0.46/0.46  INFLOW  1582               OUTFLOW  5633         B.NO. 521900                EXIST. COMB.   1583
0      YU  86.240  YL  86.182   QF   155   DQ       0   QDLM    2  VNIGHT0.18   DUC  -0.15   DLC  -0.15    QLM     116   CAP      39
       SU  89.718  SL  89.474   AF 0.166   DQD    0.0   HDLM 0.03  HNIGHT0.01   DUS  -3.17   DLS  -2.98                  QLM/QF 0.75
+                                                                                                          RAIN   7MS2
       RES     32  A      0.0    VF  0.93   GAMMA 1.00   VDLM 0.33  VNORM 0.0    HUM   0.31   HLM   0.31    QRQLM   114   DY      0.06
       IW     0.0  L      21.9   S                      SCOD 102   DWB   0.0    YUM  86.55   YLM  86.49    VLM    0.99   DH     0.00
+                                 1/ 378   N   0.0130
0
5632  CIRCULAR          0.61/0.61  INFLOW                     OUTFLOW  5633         B.NO. 633200                EXIST. COMB.   5632
0      YU  86.228  YL  86.182   QF   640   DQ       0   QDLM    0  VNIGHT0.0    DUC  -0.45   DLC  -0.41    QLM       0   CAP     640
       SU  89.483  SL  89.474   AF 0.292   DQD    0.0   HDLM 0.02  HNIGHT0.01   DUS  -3.09   DLS  -3.09                  QLM/QF 0.00
+                                                                                                          RAIN   7MS2
       RES     15  A      0.0    VF  2.19   GAMMA 1.00   VDLM 0.0   VNORM 0.0    HUM   0.16   HLM   0.20    QRQLM     0   DY      0.05
       IW     0.0  L       4.6   S                      SCOD 102   DWB   0.02   YUM  86.39   YLM  86.39    VLM    0.02   DH    -0.04
+                                 1/ 100   N   0.0130
0
 5633  CIRCULAR          0.61/0.61  INFLOW  5632  1583         OUTFLOW  5634         B.NO. 633100                EXIST. COMB.   5633
0      YU  86.182  YL  85.679   QF   526   DQ      82   QDLM    2  VNIGHT0.28   DUC  -0.40   DLC  -0.36    QLM     180   CAP     346
       SU  89.474  SL  89.764   AF 0.292   DQD    0.1   HDLM 0.02  HNIGHT0.01   DUS  -3.08   DLS  -3.84                  QLM/QF 0.34
+                                                                                                          RAIN   7MS2
       RES     27  A      0.28   VF  1.80   GAMMA 1.00   VDLM 0.45  VNORM 0.0    HUM   0.21   HLM   0.25    QRQLM   178   DY      0.50
       IW     0.0  L      74.4   S                      SCOD 102   DWB   0.0    YUM  86.39   YLM  85.93    VLM    1.63   DH    -0.04
+                                 1/ 148   N   0.0130
0
 5634  CIRCULAR          0.61/0.61  INFLOW  5633               OUTFLOW  5635         B.NO. 633100                EXIST. COMB.   5634
0      YU  85.679  YL  85.557   QF   640   DQ       0   QDLM    2  VNIGHT0.34   DUC  -0.38   DLC  -0.35    QLM     179   CAP     461
       SU  89.764  SL  89.703   AF 0.292   DQD    0.0   HDLM 0.04  HNIGHT0.01   DUS  -3.86   DLS  -3.89                  QLM/QF 0.28
+                                                                                                          RAIN   7MS2
       RES     27  A      0.0    VF  2.19   GAMMA 1.00   VDLM 0.53  VNORM 0.0    HUM   0.23   HLM   0.26    QRQLM   177   DY      0.12
       IW     0.0  L      12.2   S                      SCOD 102   DWB   0.02   YUM  85.90   YLM  85.81    VLM    1.55   DH    -0.03
+                                 1/ 100   N   0.0130
0
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 5635  CIRCULAR          0.61/0.61  INFLOW  5634  1588         OUTFLOW  5636         B.NO. 633000                EXIST. COMB.   5635
0      YU  85.557  YL  85.039   QF   550   DQ      62   QDLM    5  VNIGHT0.34   DUC  -0.35   DLC  -0.04    QLM     240   CAP     311
       SU  89.703  SL  89.855   AF 0.292   DQD    0.1   HDLM 0.04  HNIGHT0.01   DUS  -3.89   DLS  -4.24                  QLM/QF 0.44
+                                                                                                          RAIN   7MS2
       RES     34  A     0.21   VF  1.89   GAMMA 1.00   VDLM 0.64  VNORM 0.0    HUM   0.26   HLM   0.57    QRQLM   234   DY      0.52
       IW     0.0  L     70.1   S                       SCOD 102   DWB   0.0    YUM  85.81   YLM  85.61    VLM    1.82   DH    -0.32
+                                 1/ 135   N   0.0130
0
 5636  CIRCULAR          0.61/0.61  INFLOW  5635               OUTFLOW  5637         B.NO. 633000                EXIST. COMB.   5636
0      YU  85.039  YL  84.308   QF  1045   DQ       0   QDLM    5  VNIGHT0.56   DUC  -0.04   DLC   0.67    QLM     223   CAP     822
       SU  89.855  SL  90.071   AF 0.292   DQD    0.0   HDLM 0.03  HNIGHT0.01   DUS  -4.24   DLS  -4.48                  QLM/QF 0.21
+                                                                                                          RAIN   7MS2
       RES     34  A     0.0    VF  3.58   GAMMA 1.00   VDLM 1.02  VNORM 0.0    HUM   0.57   HLM   1.28    QRQLM   215   DY      0.73
       IW     0.0  L     27.4   S                       SCOD 102   DWB   0.01   YUM  85.61   YLM  85.59    VLM    1.41   DH    -0.71
+                                 1/  37   N   0.0130
0
 5637  CIRCULAR          1.60/1.60  INFLOW  1095  5636         OUTFLOW  1096         B.NO. 717100                EXIST. COMB.   5637
0      YU  84.207  YL  84.180   QF  7817   DQ       0   QDLM  124  VNIGHT0.76   DUC  -0.32   DLC  -0.30    QLM    3151   CAP    4666
       SU  90.071  SL  90.038   AF 2.007   DQD    0.0   HDLM 0.14  HNIGHT0.04   DUS  -4.59   DLS  -4.56                  QLM/QF 0.40
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  3.89   GAMMA 1.00   VDLM 1.51  VNORM 0.0    HUM   1.28   HLM   1.30    QRQLM  3030   DY      0.03
       IW     0.0  L      3.1   S                       SCOD 102   DWB   0.0    YUM  85.48   YLM  85.48    VLM    2.81   DH    -0.02
+                                 1/ 115   N   0.0130
0
 5638  EGG               0.61/0.91  INFLOW                     OUTFLOW  5639         B.NO. 632900                EXIST. COMB.   5638
0      YU  84.768  YL  84.600   QF   845   DQ      24   QDLM    0  VNIGHT0.0    DUC  -0.22   DLC  -0.05    QLM      20   CAP     825
       SU  89.645  SL  89.782   AF 0.422   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -4.19   DLS  -4.32                  QLM/QF 0.02
+                                                                                                          RAIN   7MS2
       RES      0  A     0.08   VF  2.00   GAMMA 1.00   VDLM 0.0   VNORM 0.0    HUM   0.69   HLM   0.86    QRQLM    20   DY      0.17
       IW     0.0  L     24.4   S                       SCOD 102   DWB   0.0    YUM  85.46   YLM  85.46    VLM    0.82   DH    -0.17
+                                 1/ 145   N   0.0130
0
5647  CIRCULAR          0.46/0.46  INFLOW  5646               OUTFLOW  1097         B.NO. 653400                EXIST. STORM   5647
0      YU  84.561  YL  84.216   QF  1143   DQ       0   QDLM    0  VNIGHT0.0    DUC   0.29   DLC   0.57    QLM     504   CAP     640
       SU  88.925  SL  88.880   AF 0.166   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -3.61   DLS  -3.63                  QLM/QF 0.44
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  6.89   GAMMA 1.00   VDLM 0.0   VNORM 0.0    HUM   0.75   HLM   1.03    QRQLM   504   DY      0.35
       IW     0.0  L      2.4   S                       SCOD 102   DWB   0.0    YUM  85.31   YLM  85.25    VLM    5.18   DH    -0.28
+                                 1/   7   N   0.0130
0
 5648  CIRCULAR          0.30/0.30  INFLOW                     OUTFLOW  5649         B.NO. 653400                EXIST. COMB.   5648
0      YU  85.176  YL  84.734   QF    74   DQ      43   QDLM    8  VNIGHT0.38   DUC  -0.23   DLC   0.20    QLM      39   CAP      36
       SU  88.590  SL  88.666   AF 0.071   DQD    8.3   HDLM 0.07  HNIGHT0.02   DUS  -3.34   DLS  -3.43                  QLM/QF 0.52
+                                                                                                          RAIN   7MS2
       RES     68  A     0.12   VF  1.06   GAMMA 1.00   VDLM 0.71  VNORM 0.0    HUM   0.07   HLM   0.50    QRQLM    30   DY      0.44
       IW     8.2  L     74.1   S                       SCOD 102   DWB   0.00   YUM  85.25   YLM  85.23    VLM    0.87   DH    -0.43
+                                 1/ 168   N   0.0130
0
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 5649  CIRCULAR          0.30/0.30  INFLOW  5648               OUTFLOW  5650         B.NO. 653400                EXIST. COMB.   5649
0      YU  84.734  YL  84.262   QF    73   DQ      59   QDLM    8  VNIGHT0.38   DUC   0.20   DLC   0.52    QLM      82   CAP      -8
       SU  88.666  SL  89.032   AF 0.071   DQD    0.1   HDLM 0.07  HNIGHT0.02   DUS  -3.43   DLS  -3.95                  QLM/QF 1.13
+                                                                                                          RAIN   7MS2
       RES      34  A      0.20   VF  1.03   GAMMA 1.00   VDLM 0.70  VNORM 0.0    HUM   0.50   HLM   0.82    QRQLM    74   DY      0.47
       IW     0.0  L      82.9   S                       SCOD 102   DWB   0.0    YUM  85.23   YLM  85.09    VLM     1.16   DH     -0.32
+                                 1/ 176   N   0.0130
0
 5650  CIRCULAR          0.30/0.30  INFLOW  5649               OUTFLOW  1110         B.NO. 653400                EXIST. COMB.   5650
0      YU  84.262  YL  83.119   QF   264   DQ       0   QDLM    8  VNIGHT0.07   DUC   0.52   DLC   1.61    QLM      82   CAP     183
       SU  89.032  SL  88.788   AF 0.071   DQD    0.0   HDLM 0.24  HNIGHT0.07   DUS  -3.95   DLS  -3.76                  QLM/QF 0.31
+                                                                                                          RAIN   7MS2
       RES      34  A      0.0    VF  3.75   GAMMA 1.00   VDLM 0.14  VNORM 1.77   HUM   0.82   HLM   1.91    QRQLM    73   DY      1.14
       IW     0.0  L      15.2   S                       SCOD 102   DWB   0.20   YUM  85.09   YLM  85.03    VLM     1.16   DH     -1.09
+                                 1/  13   N   0.0130
0
 5651  CIRCULAR          0.46/0.46  INFLOW                     OUTFLOW  5652         B.NO. 556901                EXIST. COMB.   5651
0      YU  84.725  YL  84.612   QF   115   DQ      84   QDLM    0  VNIGHT0.11   DUC  -0.17   DLC  -0.07    QLM      63   CAP      52
       SU  87.773  SL  87.965   AF 0.166   DQD    0.0   HDLM 0.01  HNIGHT0.00   DUS  -2.76   DLS  -2.96                  QLM/QF 0.55
+                                                                                                          RAIN   7MS2
       RES      15  A      0.30   VF  0.69   GAMMA 0.99   VDLM 0.11  VNORM 0.0    HUM   0.29   HLM   0.39    QRQLM    63   DY      0.11
       IW     0.0  L      77.7   S                       SCOD  15   DWB   0.0    YUM  85.02   YLM  85.01    VLM     0.50   DH     -0.10
+                                 1/ 688   N   0.0130
0
 5652  CIRCULAR          0.46/0.46  INFLOW  5651               OUTFLOW  5653         B.NO. 556901                EXIST. COMB.   5652
0      YU  84.612  YL  84.445   QF   135   DQ     106   QDLM    0  VNIGHT0.13   DUC  -0.07   DLC   0.0     QLM     145   CAP      -9
       SU  87.965  SL  87.798   AF 0.166   DQD    0.1   HDLM 0.01  HNIGHT0.00   DUS  -2.96   DLS  -2.89                  QLM/QF 1.07
+                                                                                                          RAIN   7MS2
       RES      15  A      0.38   VF  0.81   GAMMA 0.99   VDLM 0.14  VNORM 0.0    HUM   0.39   HLM   0.46    QRQLM   144   DY      0.17
       IW     0.0  L      83.8   S                       SCOD  15   DWB   0.0    YUM  85.01   YLM  84.90    VLM     0.87   DH     -0.07
+                                 1/ 502   N   0.0130
0
 5653  CIRCULAR          0.46/0.46  INFLOW  5652               OUTFLOW    84         B.NO. 556900                EXIST. COMB.   5653
0      YU  84.445  YL  84.064   QF   598   DQ       0   QDLM    0  VNIGHT0.56   DUC  -0.29   DLC   0.06    QLM     140   CAP     458
       SU  87.798  SL  87.974   AF 0.166   DQD    0.0   HDLM 0.00  HNIGHT0.00   DUS  -3.18   DLS  -3.39                  QLM/QF 0.23
+                                                                                                          RAIN   7MS2
       RES      15  A      0.0    VF  3.60   GAMMA 0.99   VDLM 0.56  VNORM 0.0    HUM   0.17   HLM   0.52    QRQLM   140   DY      0.38
       IW     0.0  L       9.7   S                       SCOD  15   DWB   0.0    YUM  84.61   YLM  84.58    VLM     2.94   DH     -0.35
+                                 1/  25   N   0.0130
0
 5654  CIRCULAR          0.30/0.30  INFLOW                     OUTFLOW  5655         B.NO. 602400                EXIST. COMB.   5654
0      YU  83.262  YL  82.622   QF    68   DQ      88   QDLM    0  VNIGHT0.15   DUC  -0.23   DLC   0.0     QLM      73   CAP      -4
       SU  86.289  SL  86.828   AF 0.071   DQD    0.1   HDLM 0.01  HNIGHT0.00   DUS  -2.96   DLS  -3.91                  QLM/QF 1.07
+                                                                                                          RAIN   7MS2
       RES      45  A      0.30   VF  0.97   GAMMA 1.00   VDLM 0.22  VNORM 0.0    HUM   0.07   HLM   0.30    QRQLM    73   DY      0.64
       IW     0.0  L     128.0   S                       SCOD 102   DWB   0.0    YUM  83.33   YLM  82.92    VLM     1.03   DH     -0.23
+                                 1/ 200   N   0.0130
0
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 5655  CIRCULAR         0.30/0.30  INFLOW  5654            OUTFLOW  1112        B.NO. 602400             EXIST. COMB.   5655
0      YU  82.195  YL  81.891   QF    94   DQ       0   QDLM    0  VNIGHT0.21   DUC  -0.10   DLC  -0.10    QLM      72   CAP      22
       SU  86.828  SL  86.719   AF 0.071   DQD    0.0   HDLM 0.01  HNIGHT0.00   DUS  -4.43   DLS  -4.63                  QLM/QF 0.76
+                                                                                                          RAIN   7MS2
       RES     27  A     0.0    VF  1.33   GAMMA 1.00   VDLM 0.28  VNORM 0.0    HUM   0.20   HLM   0.20    QRQLM    72   DY      0.30
       IW     0.0  L     32.0   S                       SCOD 102   DWB   0.0    YUM  82.40   YLM  82.09    VLM    1.42   DH      0.00
+                                1/ 105   N   0.0130
0
 5656  CIRCULAR         0.61/0.61  INFLOW                  OUTFLOW  5657        B.NO. 448600             EXIST. COMB.   5656
0      YU  81.525  YL  81.037   QF   550   DQ     163   QDLM   33  VNIGHT0.58   DUC  -0.51   DLC  -0.39    QLM     157   CAP     393
       SU  85.192  SL  85.283   AF 0.292   DQD   32.8   HDLM 0.10  HNIGHT0.03   DUS  -3.56   DLS  -4.02                  QLM/QF 0.29
+                                                                                                          RAIN   7MS2
       RES      0  A     0.46   VF  1.88   GAMMA 1.00   VDLM 1.07  VNORM 0.0    HUM   0.10   HLM   0.22    QRQLM   124   DY      0.49
       IW    32.8  L     66.1   S                       SCOD  15   DWB   0.0    YUM  81.63   YLM  81.26    VLM    1.63   DH     -0.12
+                                1/ 135   N   0.0130
0
 5657  CIRCULAR         0.61/0.61  INFLOW  5656            OUTFLOW  1114        B.NO. 448700             EXIST. COMB.   5657
0      YU  80.885  YL  80.742   QF   548   DQ       0   QDLM   33  VNIGHT0.58   DUC  -0.28   DLC  -0.14    QLM     155   CAP     393
       SU  85.283  SL  85.451   AF 0.292   DQD    0.0   HDLM 0.10  HNIGHT0.03   DUS  -4.07   DLS  -4.24                  QLM/QF 0.28
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  1.88   GAMMA 0.88   VDLM 1.06  VNORM 0.0    HUM   0.33   HLM   0.47    QRQLM   122   DY      0.14
       IW     0.0  L     19.5   S                       SCOD  15   DWB   0.0    YUM  81.21   YLM  81.21    VLM    1.62   DH     -0.14
+                                1/ 136   N   0.0130
0
 5658  CIRCULAR         0.38/0.38  INFLOW                  OUTFLOW  5659        B.NO. 791110             EXIST. COMB.   5658
0      YU  80.607  YL  79.263   QF   180   DQ     156   QDLM    0  VNIGHT0.0    DUC  -0.29   DLC   0.60    QLM     145   CAP      35
       SU  84.896  SL  82.906   AF 0.113   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -4.20   DLS  -2.66                  QLM/QF 0.81
+                                                                                                          RAIN   7MS2
       RES      0  A     0.55   VF  1.59   GAMMA 1.00   VDLM 0.0   VNORM 0.0    HUM   0.09   HLM   0.98    QRQLM   145   DY      1.34
       IW     0.0  L    135.9   S                       SCOD  15   DWB   0.0    YUM  80.69   YLM  80.24    VLM    1.71   DH     -0.89
+                                1/ 101   N   0.0130
0
 5659  CIRCULAR         0.38/0.38  INFLOW  5658            OUTFLOW  5660        B.NO. 791100             EXIST. COMB.   5659
0      YU  79.245  YL  79.190   QF   181   DQ       0   QDLM    0  VNIGHT0.0    DUC   0.62   DLC   0.67    QLM     145   CAP      36
       SU  82.906  SL  83.079   AF 0.113   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.66   DLS  -2.84                  QLM/QF 0.80
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  1.60   GAMMA 1.00   VDLM 0.0   VNORM 0.0    HUM   1.00   HLM   1.05    QRQLM   145   DY      0.05
       IW     0.0  L      5.5   S                       SCOD  15   DWB   0.0    YUM  80.24   YLM  80.24    VLM    1.72   DH     -0.05
+                                1/ 100   N   0.0130
0
 5660  EGG              0.61/0.91  INFLOW  5659            OUTFLOW  5661        B.NO. 817200             EXIST. COMB.   5660
0      YU  78.776  YL  78.629   QF   568   DQ     150   QDLM    0  VNIGHT0.0    DUC   0.55   DLC   0.70    QLM     280   CAP     288
       SU  83.079  SL  83.140   AF 0.422   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.84   DLS  -2.90                  QLM/QF 0.49
+                                                                                                          RAIN   7MS2
       RES      0  A     0.53   VF  1.35   GAMMA 1.00   VDLM 0.0   VNORM 0.0    HUM   1.46   HLM   1.61    QRQLM   280   DY      0.15
       IW     0.0  L     47.2   S                       SCOD  15   DWB   0.0    YUM  80.24   YLM  80.24    VLM    1.32   DH     -0.14
+                                1/ 321   N   0.0130
0
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 5661  EGG               0.61/0.91  INFLOW  5660               OUTFLOW  5662         B.NO. 817300                EXIST. COMB.   5661
0      YU  78.629  YL  78.523   QF   644   DQ      62   QDLM    0  VNIGHT0.0    DUC   0.70   DLC   0.80    QLM     333   CAP     311
       SU  83.140  SL  83.095   AF 0.422   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.90   DLS  -2.86                  QLM/QF 0.52
+                                                                                                          RAIN   7MS2
       RES      0  A      0.22   VF  1.53   GAMMA 1.00   VDLM 0.0   VNORM 0.0    HUM   1.61   HLM   1.71    QRQLM   333   DY      0.11
       IW     0.0  L      26.5   S                      SCOD  15   DWB   0.0    YUM  80.24   YLM  80.23    VLM    1.51   DH    -0.10
+                                 1/ 250   N   0.0130
0
 5662  EGG               0.61/0.91  INFLOW  5661               OUTFLOW  1116         B.NO. 817300                EXIST. COMB.   5662
0      YU  78.523  YL  77.928   QF  1492   DQ       0   QDLM    0  VNIGHT0.0    DUC   0.80   DLC   1.39    QLM     307   CAP    1184
       SU  83.095  SL  83.064   AF 0.422   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.86   DLS  -2.84                  QLM/QF 0.21
+                                                                                                          RAIN   7MS2
       RES      0  A      0.0    VF  3.53   GAMMA 1.00   VDLM 0.0   VNORM 0.0    HUM   1.71   HLM   2.30    QRQLM   307   DY      0.60
       IW     0.0  L      27.7   S                      SCOD  15   DWB   0.0    YUM  80.23   YLM  80.23    VLM    2.40   DH    -0.59
+                                 1/  47   N   0.0130
0
```

APPENDIX C

Water Servicing & Fire Flow Analysis

TABLE C1 - PROPOSED PEAK WATER DEMAND CALCULATIONS - RESIDENTIAL

		TOTAL
1.1 Total Townhouse Units	units	0
1.2 Persons Per Unit*	persons/unit	2.7
1.1 Total One-Bedroom or One Bedroom + Den Units	units	100
1.2 Persons Per Unit*	persons/unit	1.4
2.1 Total Two Bedroom Units	units	64
2.2 Persons Per Unit*	persons/unit	2.1
3.1 Total Three Bedroom Units	units	20
3.2 Persons Per Unit*	persons/unit	3.1
4.1 Total Residential Population	persons	336
4.2 Total Population Used for Calculation Purposes**	persons	340
5.1 Per Capita Demand @ 191 L/person/day	L/day	64,940
5.2 Equivalent Population Demand	L/s	0.752
6.1 Peak Hour Peaking Factor*		2.5
6.2 Peak Hour Design Demand Rate	L/s	1.9
6.3 Peak Hour Design Demand Rate (m^3/day)	m^3/day	162
7.1 Maximum Day Peaking Factor*		1.3
7.2 Maximum Day Design Demand Rate	L/s	1.0
6.4 Maximum Day Design Demand Rate (m^3/day)	m^3/day	84

* as per City of Toronto Design Criteria for Sewers and Watermains - Nov. 2009

** The population was rounded to 340 persons to provide a conservative figure for demand calculations.

TABLE C2- PROPOSED PEAK WATER DEMAND CALCULATIONS - DOMESTIC

		PEAK HOUR	MAXIMUM DAY
1.1 Residential Demand	L/s	1.88	0.98
2.1 Total Flow Rate	L/s	1.88	0.98
2.2 Total Flow Rate	L/min	113	59

TABLE C3 - FIRE DEMAND CALCULATIONS - BASED ON F.U.S. GUIDELINES - RESIDENTIAL CONDO

			TOTAL
1.1	Coefficient for type of construction:		0.6
1.2	Height in Stories		13
1.3	2nd Floor Area (Largest Floor Area)	m^2	1,126
1.4	3rd Floor Area	m^2	1,126
1.5	4th Floor Area	m^2	1,126
1.6	Stories to Use in Calculation (1 + 25% of each of the ftwo floors immediately above the largest floor)		1 + 2 * 25%
1.7	Total Area	m^2	1,689
1.8	Fire Flow Required	L/min	6,000
2.1	25% Reduction for Occupancy Charge - low fire hazard	L/min	-1,500
2.2	Fire Flow Required	L/min	4,500
3.1	50% Reduction for Automatic Sprinklers	L/min	-2,250
4.1	Charge for Building Separation		
	North: Nearest Building	3.1 to 10m	25%
	West: Nearest Building	3.1 to 10m	25%
	South: Nearest Building	20.1 - 30.0m	10%
	East: Nearest Building	20.1 - 30.0m	10%
4.2	Charge for Building Separation	L/min	3,150
5.1	Fire Flow Required	L/min	6,000
5.2	Fire Flow Required	L/s	100.0

TABLE C4 - PROPOSED REDEVELOPMENT TOTAL WATER DEMAND

PER CITY OF TORONTO DESIGN CRITERIA AND MOE DESIGN GUIDELINES, WATER SUPPLY SYSTEMS SHOULD BE DESIGNED TO SATISFY THE GREATER OF EITHER OF THE FOLLOWING DEMANDS:

-MAXIMUM DAY DOMESTIC DEMAND PLUS FIRE FLOW

-PEAK HOUR DOMESTIC DEMAND

MAX DAY & FIRE FLOWS

MAX DAY	0.98	L/S
FIRE	100.0	L/s
Total Max Day & Fire Flow	101.0	L/s

PEAK HOUR DOMESTIC DEMAND

PEAK RATE	1.88	L/s

THEREFORE, MAX DAY + FIRE FLOW IS GOVERNING REQUIREMENT

WATER DEMAND

Max Day Demand	0.98	L/s	59	L/min
Fire Flow*	100.0	L/s	6,000	L/min
Total Water Demand Requirement	101.0	L/s	6,059	L/min

Note (*): Per City of Toronto's Design Criteria for Sewers and Watermains, in accordance with the Fire Underwriters Survey (FUS), fire flows will not be less than 4,800L/minute for a 2-hour duration in addition to maximum daily domestic demand, delivered with a residual pressure of not less than 140kPa (20psi).

TABLE C5 - PROPOSED PEAK WATER DEMAND CALCULATIONS - ART

		TOTAL
1.1 Total Art Gallery Floor Area	m^2	1,544
1.2 Equivalent Population Density*	persons/100m^2	1.1
1.3 Equivalent Population	persons	17
1.4 Per Capita Demand @ 191 L/person/day*	L/day	3,243
1.5 Total Art Gallery Demand	L/s	0.04
2.1 Peak Hour Peaking Factor*		1.2
2.2 Peak Hour Design Demand	L/s	0.05
2.3 Peak HourDesign Demand	m^3/day	4
3.1 Maximum Day Peaking Factor*		1.1
3.2 Maximum Day Design Demand	L/s	0.04
3.3 Maximum Day Design Demand	m^3/day	4

* as per City of Toronto Design Criteria for Sewers and Watermains - Nov. 2009

TABLE C6- PROPOSED PEAK WATER DEMAND CALCULATIONS - DOMESTIC

		PEAK HOUR	MAXIMUM DAY
1.1 Art Gallery Demand	L/s	0.05	0.04
2.1 Total Flow Rate	L/s	0.05	0.04
2.2 Total Flow Rate	L/min	3	2

TABLE C7 - FIRE DEMAND CALCULATIONS - BASED ON F.U.S. GUIDELINES - ART GALLERY

			TOTAL
1.1	Coefficient for type of construction:		0.6
1.2	Height in Stories		3
1.3	Ground Floor Area (Largest Floor Area)	m^2	496
1.4	2nd Floor Area	m^2	556
1.5	3rd Floor Area	m^2	556
1.6	Stories to Use in Calculation (1 + 25% of each of the ftwo floors immediately above the largest floor)		1 + 2 * 25%
1.7	Total Area	m^2	774
1.8	Fire Flow Required	L/min	4,000
2.1	25% Reduction for Occupancy Charge - low fire hazard	L/min	-1,000
2.2	Fire Flow Required	L/min	3,000
3.1	50% Reduction for Automatic Sprinklers	L/min	-1,500
4.1	Charge for Building Separation		
	North: Nearest Building	20.1 - 30.0m	10%
	West: Nearest Building	3.1 to 10m	25%
	South: Nearest Building	3.1 to 10m	25%
	East: Nearest Building	20.1 - 30.0m	10%
4.2	Charge for Building Separation	L/min	2,100
5.1	Fire Flow Required	L/min	4,000
5.2	Fire Flow Required	L/s	66.7

TABLE C8 - PROPOSED REDEVELOPMENT TOTAL WATER DEMAND

PER CITY OF TORONTO DESIGN CRITERIA AND MOE DESIGN GUIDELINES, WATER SUPPLY SYSTEMS SHOULD BE DESIGNED TO SATISFY THE GREATER OF EITHER OF THE FOLLOWING DEMANDS:

-MAXIMUM DAY DOMESTIC DEMAND PLUS FIRE FLOW

-PEAK HOUR DOMESTIC DEMAND

MAX DAY & FIRE FLOWS

MAX DAY	0.04	L/S
FIRE	66.7	L/s
Total Max Day & Fire Flow	66.7	L/s

PEAK HOUR DOMESTIC DEMAND

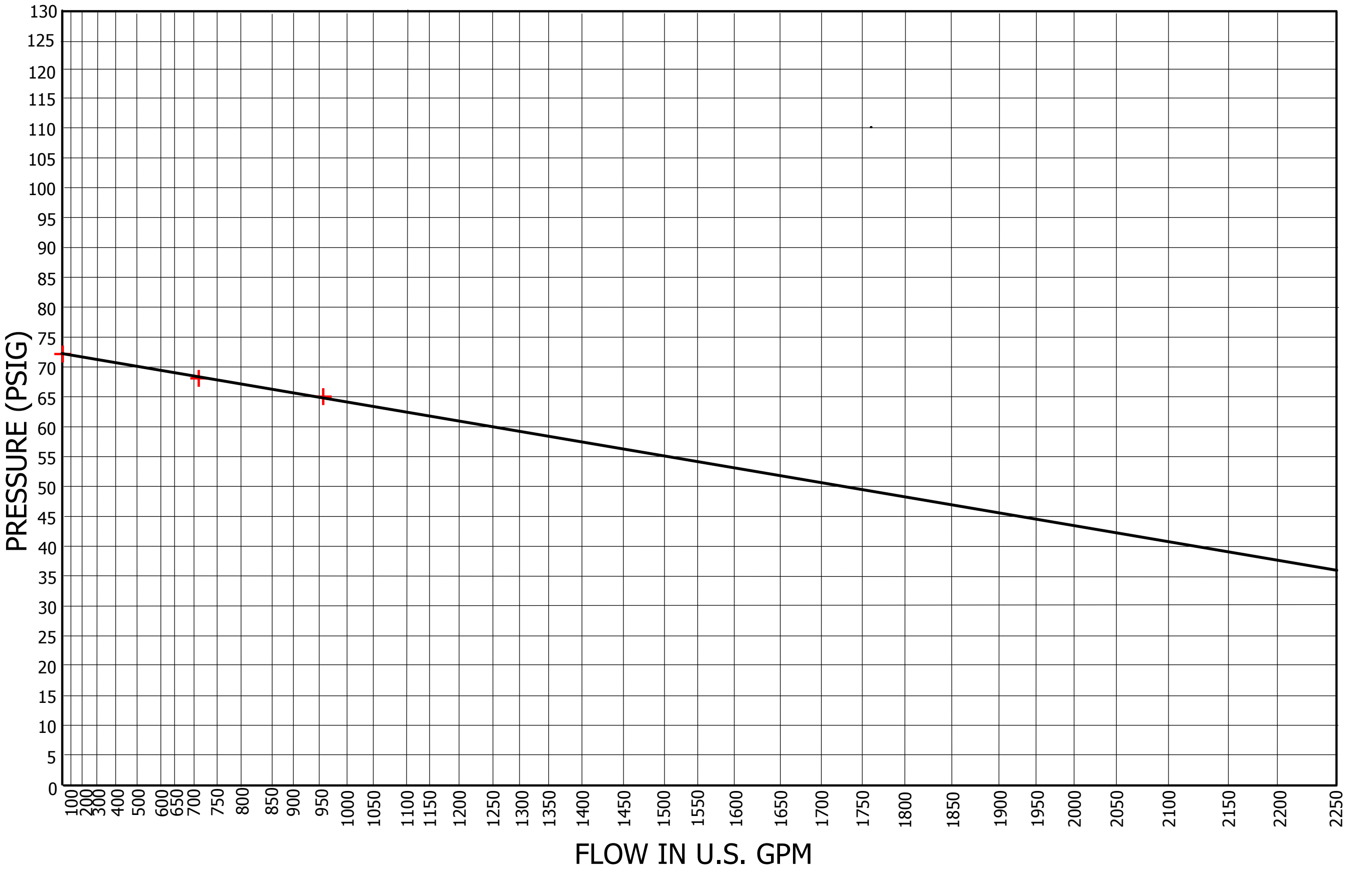
PEAK RATE	0.05	L/s

THEREFORE, MAX DAY + FIRE FLOW IS GOVERNING REQUIREMENT

WATER DEMAND

Max Day Demand	0.04	L/s	2	L/min
Fire Flow*	80.0	L/s	4,800	L/min
Total Water Demand Requirement	80.0	L/s	4,802	L/min

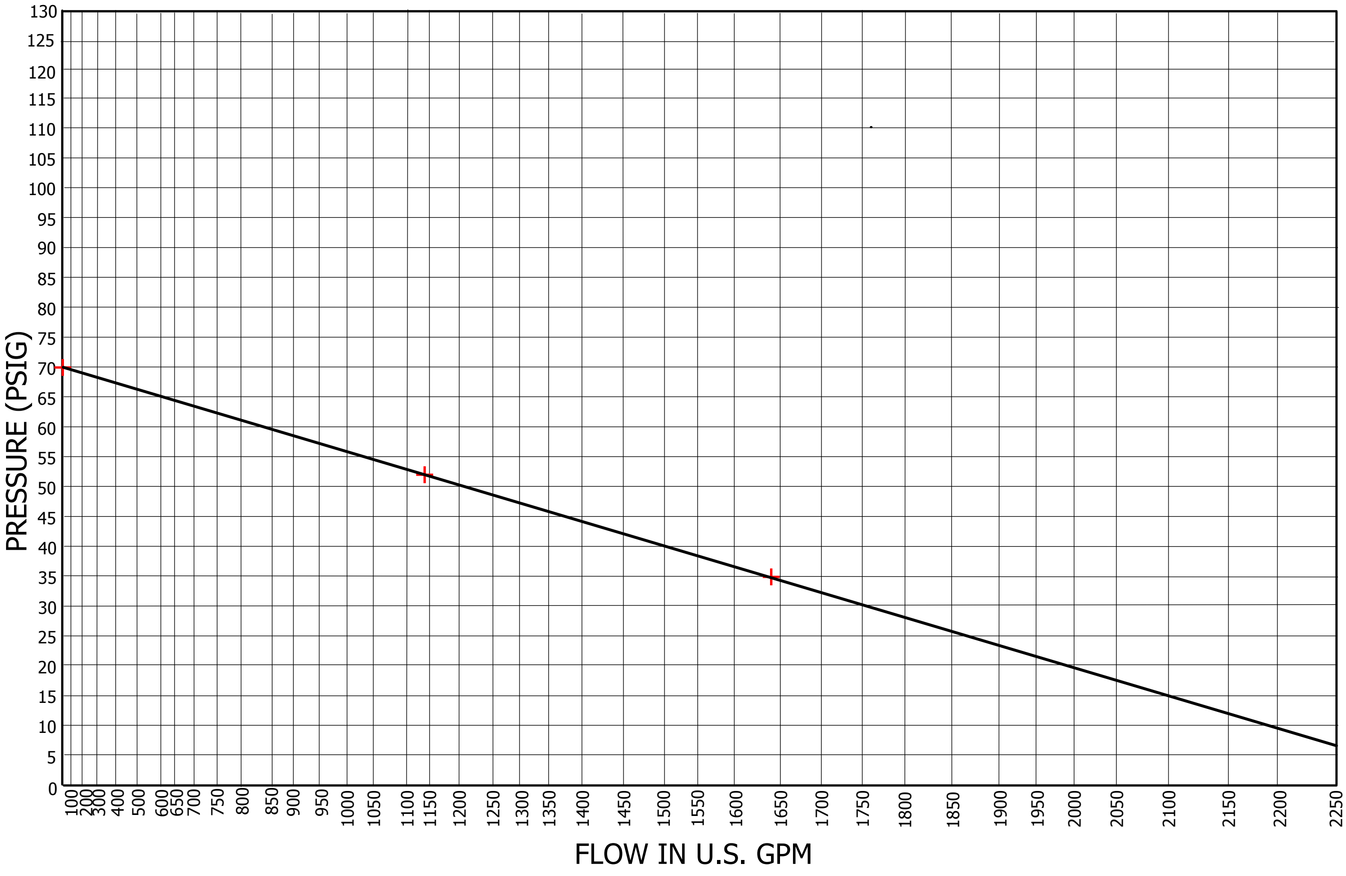
Note (*): Per City of Toronto's Design Criteria for Sewers and Watermains, in accordance with the Fire Underwriters Survey (FUS), fire flows will not be less than 4,800L/minute for a 2-hour duration in addition to maximum daily domestic demand, delivered with a residual pressure of not less than 140kPa (20psi).



PORT No.	PORT DIA. (in/mm)	PITOT (psig)	FLOW (usgpm)	RESIDUAL (psig)
1	2.50/63,5	18	710	68
2	2.50/63,5	8/8	960	65
THEORETICAL FLOW @ 20psi			2844	

General Data	
Test Date	07 May 2013
Test Time	05:00am
Pipe Dia.	150mm or 200mm
Static	72psig

Site Information	
Site or Developer Name	Tridel Corporation
Site Address/Municipality	Toronto
Location of Test Hydrant	Stephanie Street, 1st West of McCaul Street
Location of Base Hydrant	Front of 35 McCaul Street
Technician's Comments	No conversion factor used for flow calculation based on rounded & flush internal nozzle configuration. Refer to attached letter for any further comments. Verified By: Mark Schmidt



PORT No.	PORT DIA. (in/mm)	PITOT (psig)	FLOW (usgpm)	RESIDUAL (psig)
1	2.50/63,5	46	1140	52
2	2.50/63,5	24/24	1640	35
THEORETICAL FLOW @ 20psi			1976	

General Data	
Test Date	07 May 2013
Test Time	05:45am
Pipe Dia.	150mm or 200mm
Static	70psig

Site Information	
Site or Developer Name	Tridel Corporation
Site Address/Municipality	Toronto
Location of Test Hydrant	Grange Road, 1st West of McCaul Street
Location of Base Hydrant	Grange Road, 2nd West of McCaul Street
Technician's Comments	No conversion factor used for flow calculation based on rounded & flush internal nozzle
	configuration. Refer to attached letter for any further comments.
	Verified By: Mark Schmidt

APPENDIX D

Storm Servicing Analysis

CRITERIA: REDUCE POST DEVELOPMENT FLOWS FROM THE 2 TO 100-YEAR EVENTS TO THE 2-YEAR PRE-DEVELOPMENT PEAK FLOW RATE WITH A MAXIMUM RUNOFF COEFFICIENT OF "C"=0.50

ALLOWABLE FOR ENTIRE PROPERTY

2-YEAR TORONTO

A= 531.391

B= 0.0

C= 0.78

TIME OF CONCENTRATION (Tc)

10

INTENSITY = A/(t+B)^C

88.2 mm/hr

AREA

2,813 m^2

RUN-OFF COEFFICIENT

C= 0.50

PEAK FLOW

Q = CiA

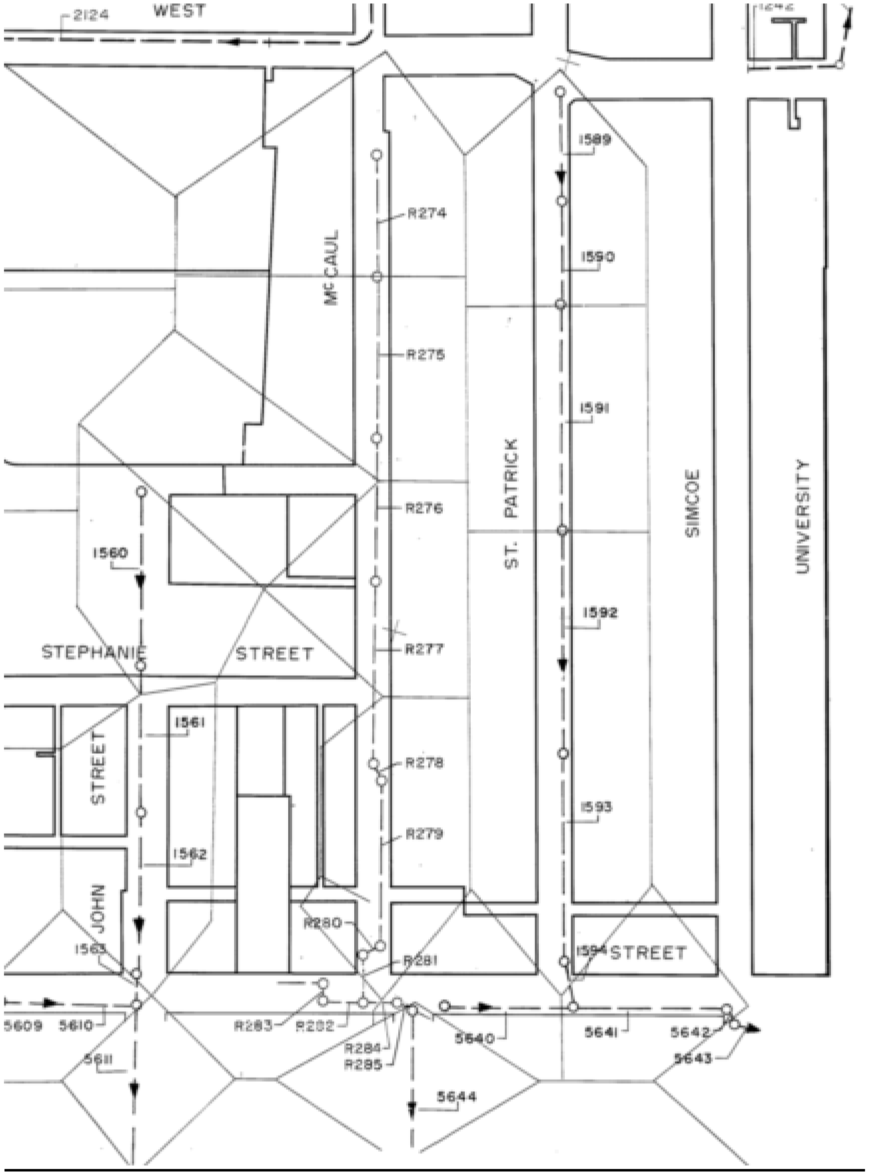
Q = 34.5 L/s

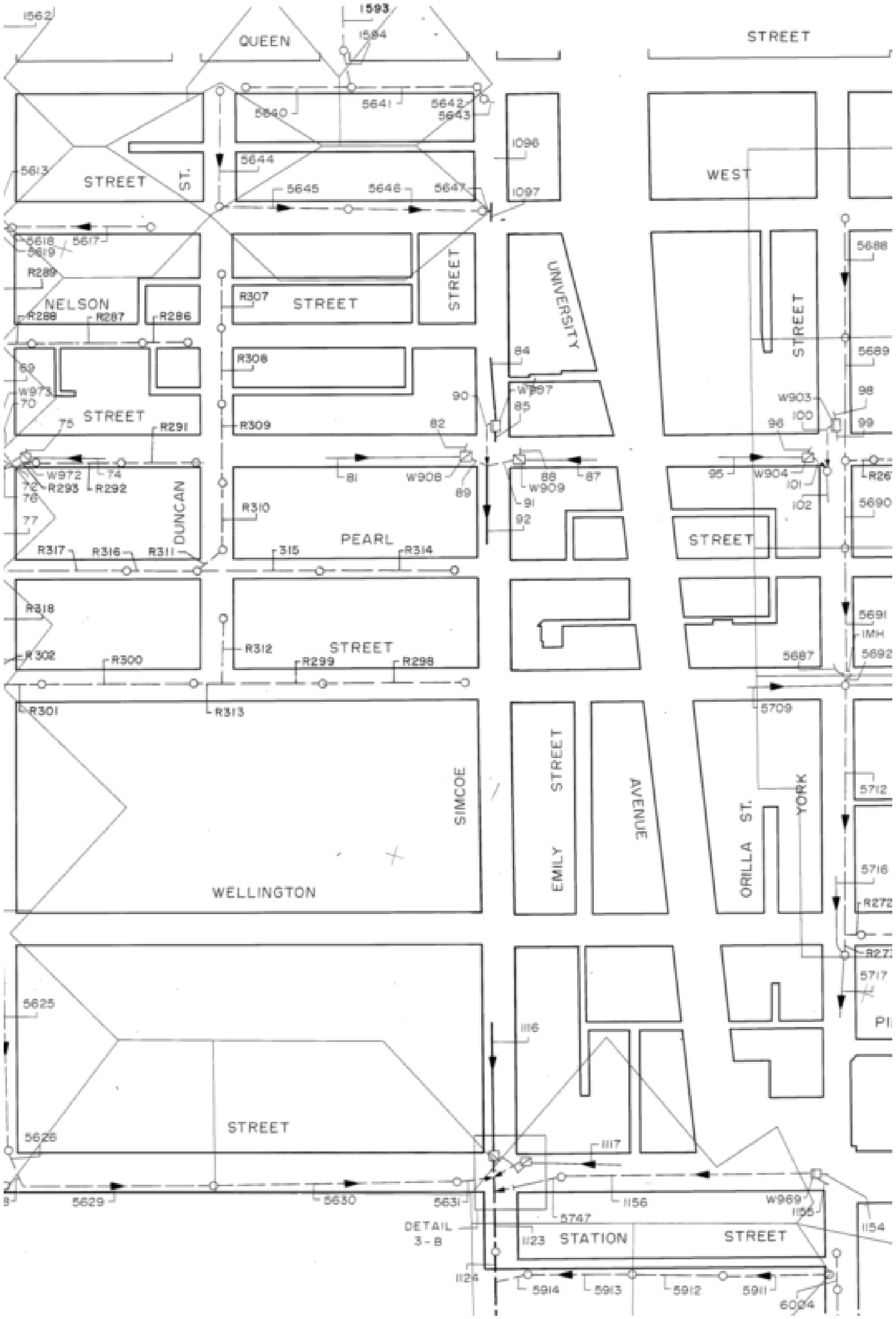
ESTIMATED HYDRAULIC GRADE LINE IMPACT OF DESIGN FLOW

Surcharged Pipe Segment	HVM Diameter (mm)	HVM Lengh (m)	HVM Slope (%)	HVM Capacity (L/s)	HVM Total Flow (L/s)	Theoretical Slope of HGL based on Velocity Head (%)	Total Flow with Development Flow Added (L/s)	Theoretical Slope of HGL based on Velocity Head with Development Flow Added (%)	Difference in Slope (%)	Increase in HGL (m)
R279	609.6	100.6	0.649	516	500	0.6490	535	0.6980	0.05	0.0493

TOTAL INCREASE IN HGL (m) = 0.0493

Storm Sewers

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SIMCOE
EMILY
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AVENUE
ORILLA ST.
YORK
WELLINGTON
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STATION
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5631
5747
1156
W969
1155
1154
1123
1124
5914
5913
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5911
6004

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5630  ELLIPSE          1.09/1.73  INFLOW  5629              OUTFLOW  5631        B.NO. 312400              EXIST. STORM   5630
0      YU  76.529  YL  75.654   QF  4326   DQ     149   QDLM    0  VNIGHT0.55   DUC   1.41   DLC   1.95    QLM    2717   CAP    1610
       SU  82.128  SL  81.311   AF 1.520   DQD    0.0   HDLM 0.00  HNIGHT0.00   DUS  -2.46   DLS  -1.97                  QLM/QF 0.63
+                                                                                                          RAIN   7MS2
       RES      0  A     1.29   VF  2.85   GAMMA 0.38   VDLM 0.55  VNORM 0.0    HUM   3.14   HLM   3.68    QRQLM  2713   DY     0.88
       IW     0.0  L    149.0   S                       SCOD 211   DWB   0.0    YUM  79.67   YLM  79.34    VLM    2.61   DH    -0.54
+                                1/ 170   N   0.0130
0
 5631  ELLIPSE          1.09/1.73  INFLOW  5630              OUTFLOW  5750        B.NO. 312400              EXIST. STORM   5631
0      YU  75.593  YL  74.219   QF 13480   DQ       0   QDLM    0  VNIGHT0.00   DUC   2.01   DLC   3.33    QLM    2717   CAP   10763
       SU  81.311  SL  81.022   AF 1.520   DQD    0.0   HDLM 0.43  HNIGHT0.43   DUS  -1.97   DLS  -1.74                  QLM/QF 0.20
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  8.87   GAMMA 0.38   VDLM 0.00  VNORM 1.73   HUM   3.74   HLM   5.06    QRQLM  2713   DY     1.37
       IW     0.0  L     24.1   S                       SCOD 211   DWB   0.43   YUM  79.34   YLM  79.28    VLM    1.79   DH    -1.32
+                                1/  18   N   0.0130
0
5640  CIRCULAR         0.38/0.38  INFLOW                    OUTFLOW  5641        B.NO. 633100              EXIST. STORM   5640
0      YU  87.100  YL  86.777   QF   131   DQ      63   QDLM    0  VNIGHT0.0    DUC  -0.30   DLC  -0.19    QLM      59   CAP      72
       SU  89.517  SL  89.629   AF 0.113   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.34   DLS  -2.66                  QLM/QF 0.45
+                                                                                                          RAIN   7MS2
       RES      0  A     0.22   VF  1.16   GAMMA 1.00   VDLM 0.0   VNORM 0.0    HUM   0.08   HLM   0.19    QRQLM    59   DY     0.32
       IW     0.0  L     61.6   S                       SCOD 211   DWB   0.0    YUM  87.18   YLM  86.97    VLM    1.04   DH    -0.12
+                                1/ 191   N   0.0130
0
 5641  CIRCULAR         0.84/0.84  INFLOW  5640  1594         OUTFLOW  5642        B.NO. 633000              EXIST. STORM   5641
0      YU  86.338  YL  86.069   QF   921   DQ      92   QDLM    0  VNIGHT0.0    DUC  -0.23   DLC  -0.21    QLM     774   CAP     147
       SU  89.629  SL  89.852   AF 0.553   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.68   DLS  -3.15                  QLM/QF 0.84
+                                                                                                          RAIN   7MS2
       RES      0  A     0.33   VF  1.66   GAMMA 0.97   VDLM 0.0   VNORM 0.0    HUM   0.61   HLM   0.63    QRQLM   774   DY     0.27
       IW     0.0  L     71.6   S                       SCOD 211   DWB   0.0    YUM  86.95   YLM  86.70    VLM    1.75   DH    -0.03
+                                1/ 266   N   0.0130
0
 5642  CIRCULAR         0.84/0.84  INFLOW  5641              OUTFLOW  5643        B.NO. 633000              EXIST. STORM   5642
0      YU  86.060  YL  85.905   QF  1339   DQ       0   QDLM    0  VNIGHT0.0    DUC  -0.20   DLC  -0.10    QLM     752   CAP     587
       SU  89.852  SL  90.032   AF 0.553   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -3.15   DLS  -3.38                  QLM/QF 0.56
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  2.42   GAMMA 0.97   VDLM 0.0   VNORM 0.0    HUM   0.64   HLM   0.74    QRQLM   752   DY     0.15
       IW     0.0  L     19.5   S                       SCOD 211   DWB   0.0    YUM  86.70   YLM  86.65    VLM    2.25   DH    -0.10
+                                1/ 126   N   0.0130
0
 5643  CIRCULAR         0.46/0.46  INFLOW  5642              OUTFLOW  1096        B.NO. 633000              EXIST. STORM   5643
0      YU  85.746  YL  85.100   QF  2212   DQ       0   QDLM    0  VNIGHT0.0    DUC  -0.28   DLC  -0.10    QLM     752   CAP    1460
       SU  90.032  SL  90.038   AF 0.166   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -4.10   DLS  -4.58                  QLM/QF 0.34
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF 13.33   GAMMA 0.97   VDLM 0.0   VNORM 0.0    HUM   0.18   HLM   0.36    QRQLM   752   DY     0.65
       IW     0.0  L      1.2   S                       SCOD 211   DWB   0.0    YUM  85.93   YLM  85.46    VLM   12.09   DH    -0.17
+                                1/   2   N   0.0130
0
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 5644  CIRCULAR          0.61/0.61  INFLOW  R285               OUTFLOW  5645         B.NO. 304                   EXIST. STORM   5644
0      YU  85.887  YL  85.634   QF   386   DQ      84   QDLM    0  VNIGHT0.0    DUC   0.04   DLC   0.0     QLM     444   CAP     -57
       SU  89.453  SL  88.541   AF 0.292   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.92   DLS  -2.30                  QLM/QF 1.15
+                                                                                                          RAIN   7MS2
       RES      0  A     0.30   VF  1.32   GAMMA 0.97   VDLM 0.0   VNORM 0.0    HUM   0.65   HLM   0.61    QRQLM   444   DY      0.25
       IW     0.0  L     69.5   S                       SCOD 211   DWB   0.0    YUM  86.54   YLM  86.24    VLM    1.52   DH      0.04
+                                 1/ 275   N   0.0130
0
R274  CIRCULAR          0.38/0.38  INFLOW                     OUTFLOW  R275         B.NO. 222                   EXIST. STORM   R274
0      YU  91.839  YL  91.388   QF   172   DQ     191   QDLM    0  VNIGHT0.0    DUC  -0.24   DLC   0.0     QLM     182   CAP     -10
       SU  94.945  SL  94.491   AF 0.113   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.97   DLS  -2.72                  QLM/QF 1.06
+                                                                                                          RAIN   7MS2
       RES      0  A     1.20   VF  1.52   GAMMA 0.54   VDLM 0.0   VNORM 0.0    HUM   0.14   HLM   0.38    QRQLM   182   DY      0.45
       IW     0.0  L     50.3   S                       SCOD 211   DWB   0.0    YUM  91.98   YLM  91.77    VLM    1.62   DH     -0.24
+                                 1/ 112   N   0.0130
0
 R275  CIRCULAR          0.46/0.46  INFLOW  R274               OUTFLOW  R276         B.NO. 222                   EXIST. STORM   R275
0      YU  91.388  YL  90.468   QF   296   DQ       0   QDLM    0  VNIGHT0.0    DUC  -0.20   DLC  -0.21    QLM     170   CAP     126
       SU  94.491  SL  93.583   AF 0.164   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.84   DLS  -2.87                  QLM/QF 0.57
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  1.81   GAMMA 0.0    VDLM 0.0   VNORM 0.0    HUM   0.26   HLM   0.25    QRQLM   170   DY      0.92
       IW     0.0  L     92.4   S                       SCOD 211   DWB   0.0    YUM  91.65   YLM  90.72    VLM    1.86   DH      0.01
+                                 1/ 100   N   0.0130
0
 R276  CIRCULAR          0.53/0.53  INFLOW  R275               OUTFLOW  R277         B.NO. 222                   EXIST. STORM   R276
0      YU  90.388  YL  89.340   QF   539   DQ     175   QDLM    0  VNIGHT0.0    DUC  -0.32   DLC  -0.23    QLM     331   CAP     208
       SU  93.583  SL 100.404   AF 0.223   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.98   DLS -10.76                  QLM/QF 0.61
+                                                                                                          RAIN   7MS2
       RES      0  A     1.10   VF  2.42   GAMMA 0.54   VDLM 0.0   VNORM 0.0    HUM   0.22   HLM   0.30    QRQLM   331   DY      1.05
       IW     0.0  L     71.9   S                       SCOD 211   DWB   0.0    YUM  90.60   YLM  89.64    VLM    2.52   DH     -0.09
+                                 1/  69   N   0.0130
0
 R277  CIRCULAR          0.53/0.53  INFLOW  R276               OUTFLOW  R278         B.NO. 221                   EXIST. STORM   R277
0      YU  89.334  YL  87.813   QF   587   DQ       0   QDLM    0  VNIGHT0.0    DUC  -0.25   DLC  -0.25    QLM     315   CAP     272
       SU 100.404  SL  91.172   AF 0.223   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS -10.78   DLS  -3.08                  QLM/QF 0.54
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  2.63   GAMMA 0.0    VDLM 0.0   VNORM 0.0    HUM   0.29   HLM   0.28    QRQLM   315   DY      1.52
       IW     0.0  L     88.1   S                       SCOD 211   DWB   0.0    YUM  89.62   YLM  88.09    VLM    2.67   DH      0.01
+                                 1/  58   N   0.0130
0
 R278  CIRCULAR          0.53/0.53  INFLOW  R277               OUTFLOW  R279         B.NO. 220                   EXIST. STORM   R278
0      YU  87.801  YL  87.578   QF   780   DQ       0   QDLM    0  VNIGHT0.0    DUC  -0.26   DLC  -0.09    QLM     314   CAP     466
       SU  91.172  SL  91.135   AF 0.223   DQD    0.0   HDLM 0.03  HNIGHT0.03   DUS  -3.09   DLS  -3.12                  QLM/QF 0.40
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  3.50   GAMMA 0.0    VDLM 0.0   VNORM 0.0    HUM   0.28   HLM   0.44    QRQLM   314   DY      0.22
       IW     0.0  L      7.3   S                       SCOD 211   DWB  0.03    YUM  88.08   YLM  88.02    VLM    1.62   DH     -0.16
+                                 1/  33   N   0.0130
0
```

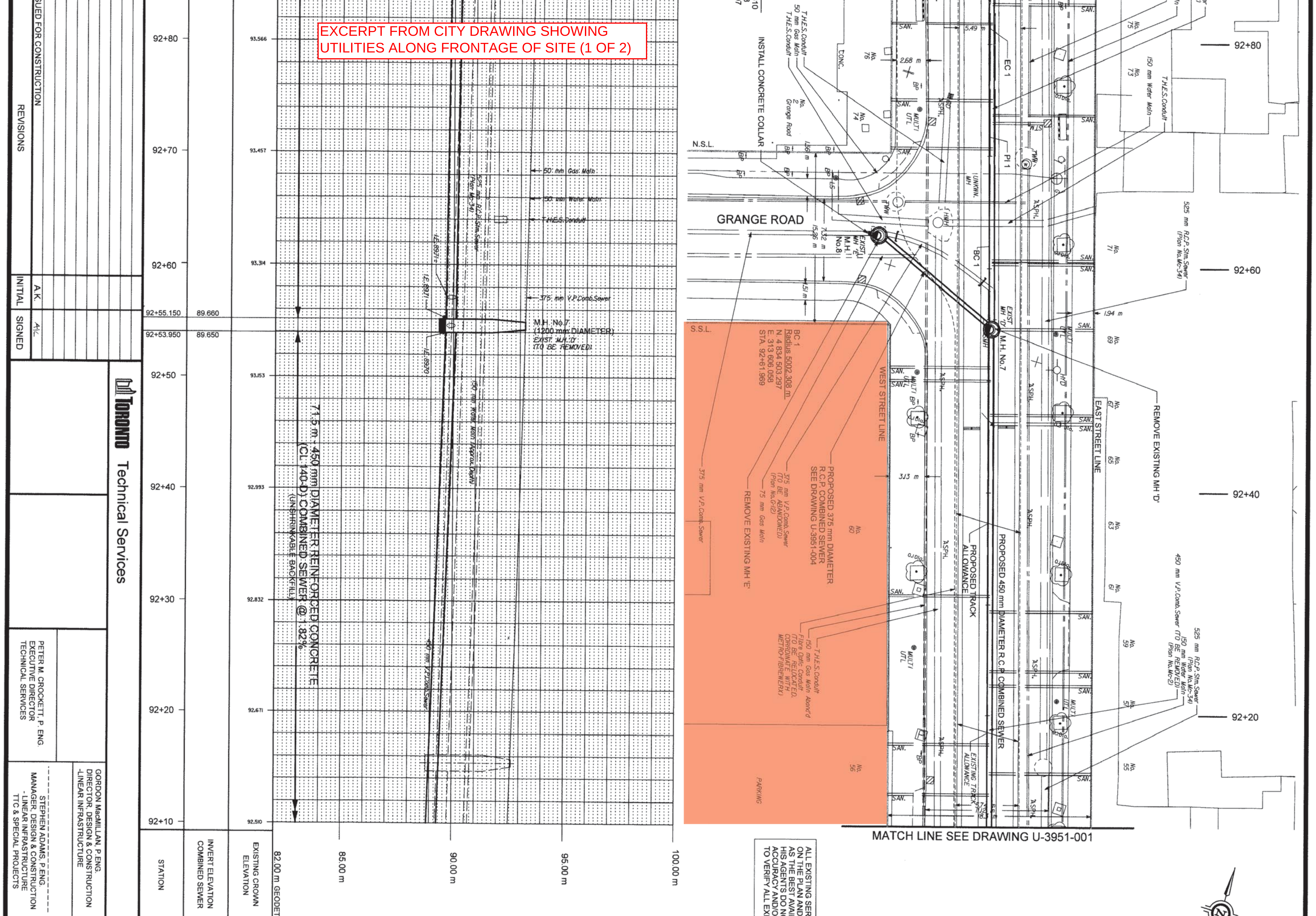
```
 R279  CIRCULAR          0.61/0.61  INFLOW  R278               OUTFLOW  R280         B.NO. 220                  EXIST. STORM   R279
0      YU  87.612  YL  86.959   QF   516   DQ     227   QDLM    0  VNIGHT0.0    DUC  -0.21   DLC  -0.07    QLM     500   CAP      15
       SU  91.135  SL  89.739   AF 0.292   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -3.12   DLS  -2.24                  QLM/QF 0.97
+                                                                                                          RAIN   7MS2
       RES      0  A     1.50   VF  1.77   GAMMA 0.51   VDLM 0.0   VNORM 0.0    HUM   0.40   HLM   0.54    QRQLM   500   DY      0.65
       IW     0.0  L    100.6   S                       SCOD 211   DWB   0.0    YUM  88.02   YLM  87.50    VLM     1.90   DH     -0.14
+                                 1/ 154   N   0.0130
0
 R280  CIRCULAR          0.61/0.61  INFLOW  R279               OUTFLOW  R281         B.NO. 219                  EXIST. STORM   R280
0      YU  86.947  YL  86.606   QF   967   DQ       0   QDLM    0  VNIGHT0.0    DUC  -0.30   DLC  -0.30    QLM     500   CAP     467
       SU  89.739  SL  89.575   AF 0.292   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.48   DLS  -2.66                  QLM/QF 0.52
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  3.31   GAMMA 0.0    VDLM 0.0   VNORM 0.0    HUM   0.31   HLM   0.31    QRQLM   500   DY      0.34
       IW     0.0  L     14.9   S                       SCOD 211   DWB   0.0    YUM  87.26   YLM  86.92    VLM     3.33   DH      0.00
+                                 1/  44   N   0.0130
0
 R281  CIRCULAR          0.61/0.61  INFLOW  R280               OUTFLOW  R282  R284   B.NO. 219                  EXIST. STORM   R281
0      YU  86.161  YL  86.085   QF   351   DQ      40   QDLM    0  VNIGHT0.0    DUC   0.09   DLC   0.0     QLM     530   CAP    -178
       SU  89.575  SL  89.489   AF 0.292   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.72   DLS  -2.79                  QLM/QF 1.51
+                                                                                                          RAIN   7MS2
       RES      0  A     0.14   VF  1.20   GAMMA 1.00   VDLM 0.0   VNORM 0.0    HUM   0.70   HLM   0.61    QRQLM   530   DY      0.08
       IW     0.0  L     25.3   S                       SCOD 211   DWB   0.0    YUM  86.86   YLM  86.69    VLM     1.82   DH      0.09
+                                 1/ 333   N   0.0130
0
 R282  CIRCULAR          0.31/0.31  INFLOW  R281               OUTFLOW  R283         B.NO. 332                  EXIST. STORM   R282
0      YU  86.225  YL  86.109   QF   109   DQ       0   QDLM    0  VNIGHT0.0    DUC   0.10   DLC   0.0     QLM     148   CAP     -38
       SU  89.489  SL  89.400   AF 0.073   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.86   DLS  -2.99                  QLM/QF 1.36
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  1.50   GAMMA 0.0    VDLM 0.0   VNORM 0.0    HUM   0.40   HLM   0.31    QRQLM   148   DY      0.12
       IW     0.0  L      9.9   S                       SCOD 211   DWB   0.0    YUM  86.63   YLM  86.41    VLM     2.03   DH      0.10
+                                 1/  85   N   0.0130
0
 R283  CIRCULAR          0.31/0.31  INFLOW  R282               OUTFLOW  5560         B.NO. 3321                 EXIST. STORM   R283
0      YU  85.948  YL  85.832   QF   110   DQ       0   QDLM    0  VNIGHT0.0    DUC   0.10   DLC   0.0     QLM     148   CAP     -37
       SU  89.400  SL  89.380   AF 0.073   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -3.05   DLS  -3.24                  QLM/QF 1.35
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  1.51   GAMMA 0.0    VDLM 0.0   VNORM 0.0    HUM   0.40   HLM   0.31    QRQLM   148   DY      0.12
       IW     0.0  L      9.8   S                       SCOD 211   DWB   0.0    YUM  86.35   YLM  86.14    VLM     2.03   DH      0.10
+                                 1/  84   N   0.0130
0
 R284  CIRCULAR          0.61/0.61  INFLOW  R281               OUTFLOW  R285         B.NO. 332                  EXIST. STORM   R284
0      YU  86.069  YL  85.981   QF   375   DQ       0   QDLM    0  VNIGHT0.0    DUC   0.00   DLC   0.0     QLM     382   CAP      -5
       SU  89.489  SL  89.137   AF 0.292   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.81   DLS  -2.55                  QLM/QF 1.02
+                                                                                                          RAIN   7MS2
       RES      0  A     0.0    VF  1.29   GAMMA 0.0    VDLM 0.0   VNORM 0.0    HUM   0.61   HLM   0.61    QRQLM   382   DY      0.09
       IW     0.0  L     25.6   S                       SCOD 211   DWB   0.0    YUM  86.68   YLM  86.59    VLM     1.37   DH      0.00
+                                 1/ 291   N   0.0130
0
```

```
 R285  CIRCULAR          0.61/0.61  INFLOW  R284                OUTFLOW  5644        B.NO. 332                     EXIST. STORM   R285
0      YU  85.969  YL  85.926   QF   501   DQ        0   QDLM    0  VNIGHT0.0    DUC  -0.02   DLC  -0.00    QLM     381   CAP     120
       SU  89.137  SL  89.453   AF 0.292   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.58   DLS  -2.92                  QLM/QF 0.76
+                                                                                                            RAIN   7MS2
       RES      0  A     0.0    VF  1.72   GAMMA 0.0    VDLM 0.0   VNORM 0.0    HUM   0.59   HLM   0.61    QRQLM   381   DY     0.04
       IW     0.0  L      7.0   S                       SCOD 211   DWB   0.0    YUM  86.56   YLM  86.54    VLM    1.50   DH    -0.02
+                                 1/ 163   N   0.0130
0
 R286  CIRCULAR          0.30/0.30  INFLOW                      OUTFLOW  R287        B.NO. 570                     EXIST. STORM   R286
0      YU  85.100  YL  84.960   QF    63   DQ       67   QDLM    0  VNIGHT0.0    DUC  -0.12   DLC  -0.02    QLM      63   CAP       1
       SU  87.420  SL  87.450   AF 0.071   DQD    0.0   HDLM 0.0   HNIGHT0.0    DUS  -2.14   DLS  -2.21                  QLM/QF 0.99
+                                                                                                            RAIN   7MS2
       RES      0  A     0.24   VF  0.90   GAMMA 0.98   VDLM 0.0   VNORM 0.0    HUM   0.18   HLM   0.28    QRQLM    63   DY     0.14
       IW     0.0  L     32.3   S                       SCOD 211   DWB   0.0    YUM  85.28   YLM  85.24    VLM    0.97   DH    -0.10
+                                 1/ 231   N   0.0130
0
```

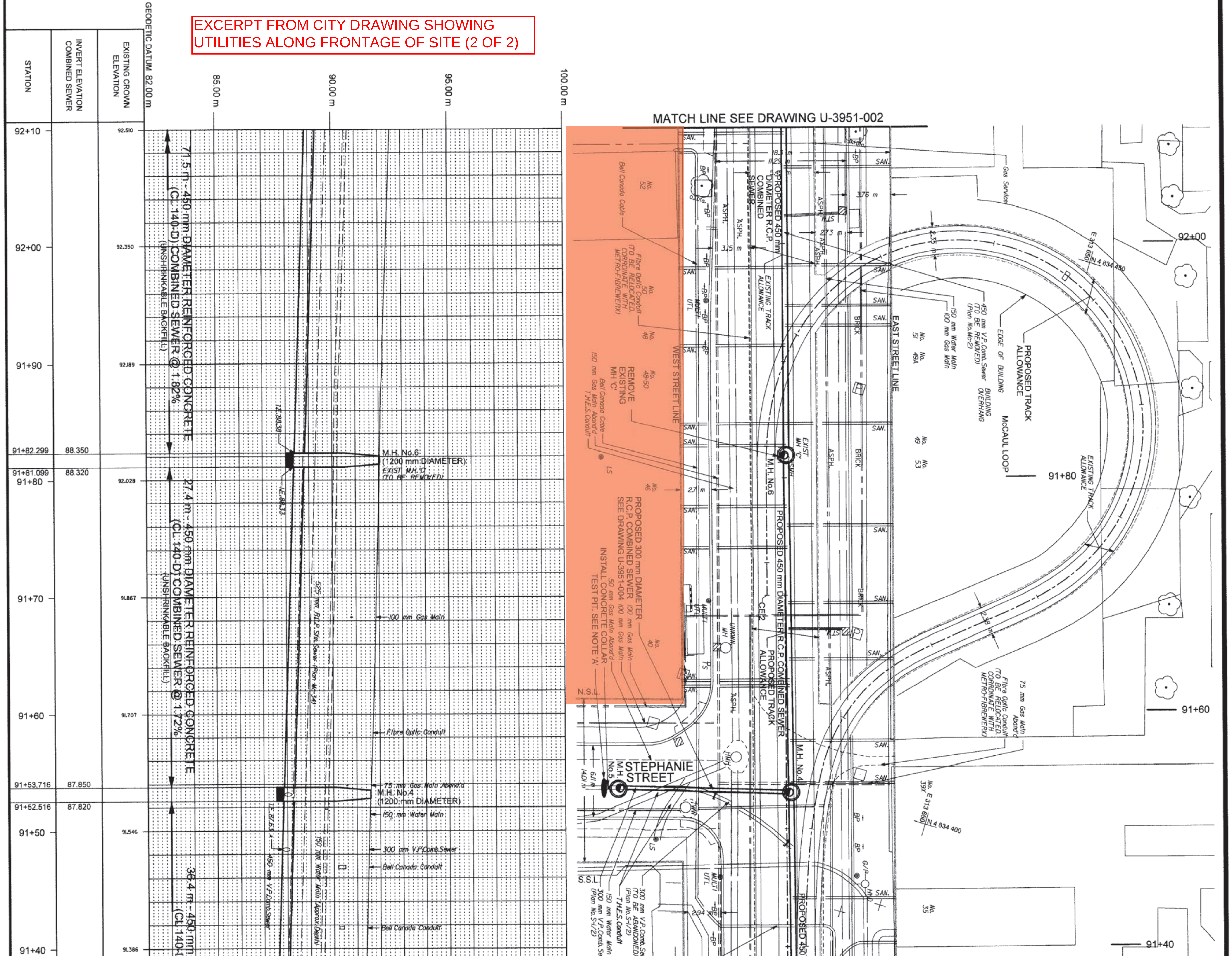
APPENDIX E

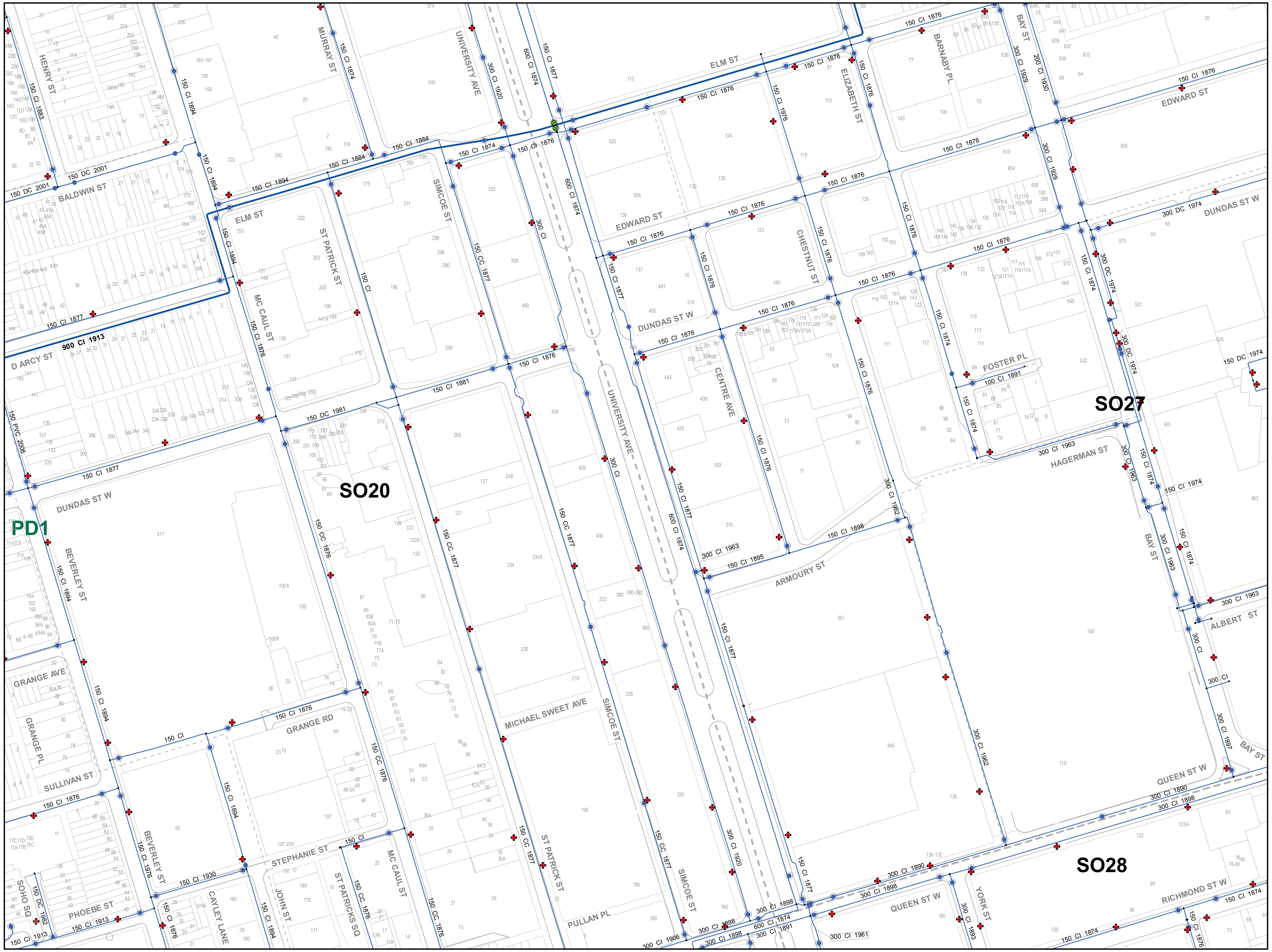
Plan and Profile Drawings and Atlas Mapping

EXCERPT FROM CITY DRAWING SHOWING UTILITIES ALONG FRONTAGE OF SITE (1 OF 2)



EXCERPT FROM CITY DRAWING SHOWING UTILITIES ALONG FRONTAGE OF SITE (2 OF 2)





Toronto Water Atlas

Hydrant
- ● Other
- ✚ City of Toronto
- ✚ Private

- ✳ PRV
- ▣ Meter
- ● Pressure District Valve

Metro Connection Valve
- ● Open
- ⊙ Closed

Valve
- ● Open
- ● Closed
- ○ Chamber
- ● Sanitary Pump Station

Watermain
- Distribution
- Transmission
- Metro Connection
- ▨ Encasement

- Abandoned Main
- Forcemain
- 🟦 Reservoir
- Pressure District Boundary

- River
- Highway
- Curb
- Wards Boundary

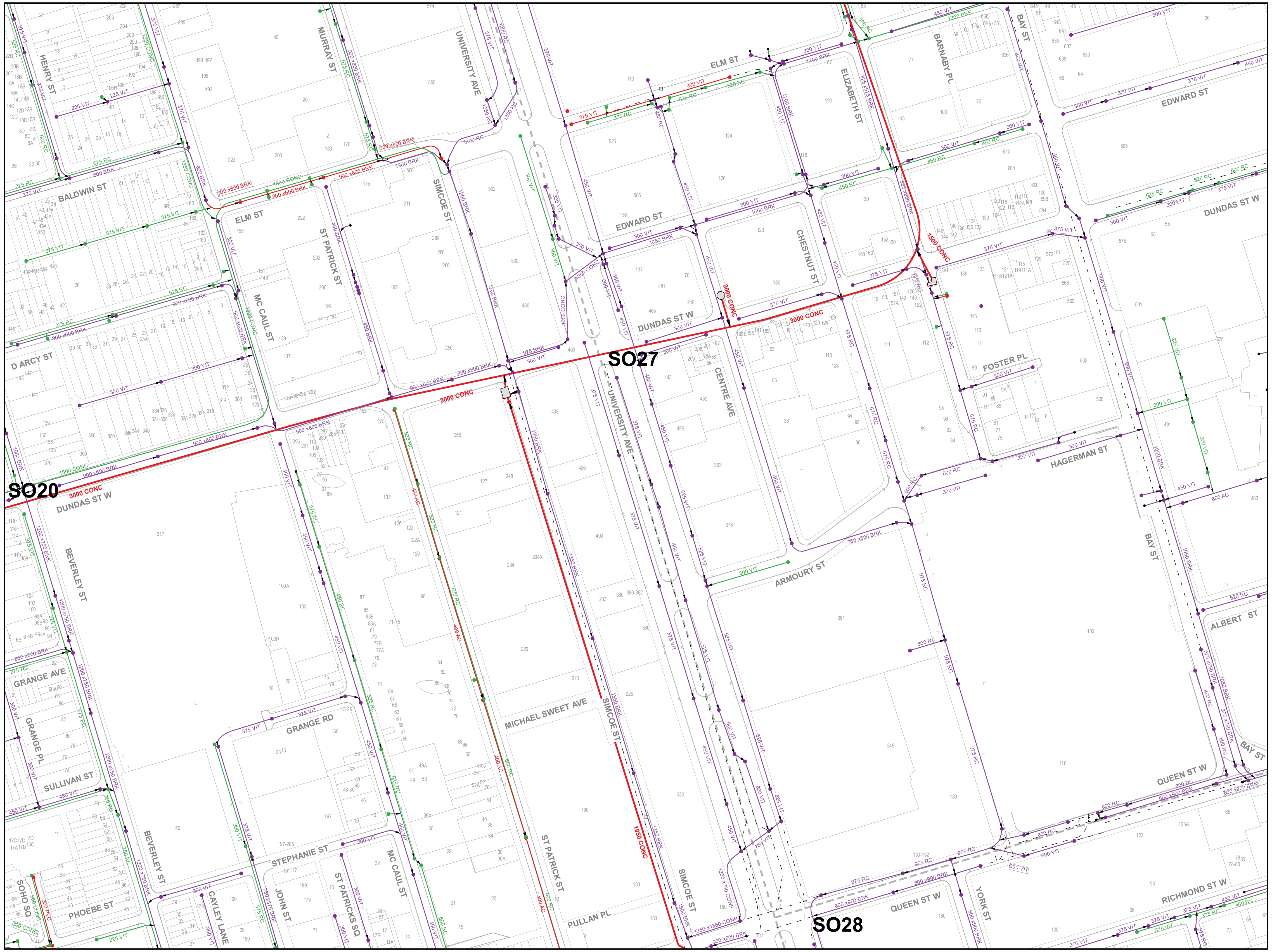
Third Edition
Date: 01/09/2010

0 50 100 150 200 Metres

General Notes:
- The maps were prepared based on the most current data available to Toronto Water as of the Map Source Date.
- These maps are for planning purpose only and must not be used for construction, or as a replacement for a utility locate.
- This drawing is not to be reproduced in whole or in part without the express written permission of the City.
- Any discrepancies, inaccuracies, errors and/or omissions in the maps should be reported to Toronto Water, Water Infrastructure Management. (18th Floor, Metro Hall, 55 John St, Toronto, ON, M5V 3C6) (Tel: 416-392-3957)

N
W E
S

616	650	685
617	651	686
618	652	687



Toronto Sewer Atlas

▭	Large Chamber

Manhole
- ● Combined
- ● Dual
- ● Sanitary
- ● Storm
- ● Foundation

Control Manhole
- ■ Combined
- ■ Dual
- ■ Sanitary
- ■ Storm

Outfall
-) Outfall

Sewer Pump Station
- ▨ Sewer Pump Station

Catchbasin
- □ Other
- ⊟ Twin Inlet Catchbasin

Sewer
- → Foundation Drain
- → Combined
- → Sanitary
- → Storm
- → Combined Trunk
- → Sanitary Trunk
- → Storm Trunk
- -- Abandoned Sewer
- River
- Highway
- Curb
- Wards Boundary

0 50 100 150 200 Metres

Third Edition
Date: 01/09/2010

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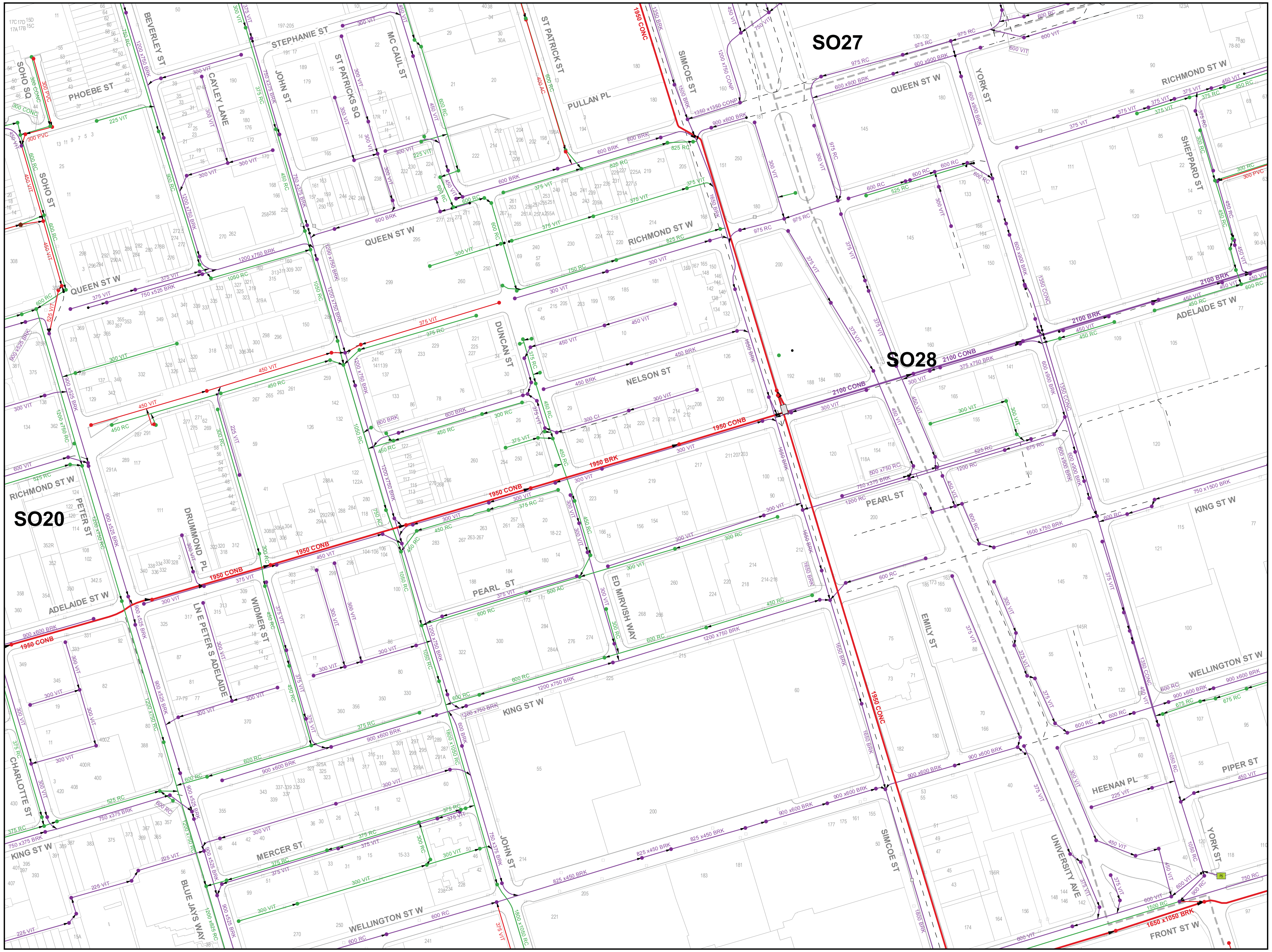
N
W E
S

616	650	685
617	651	686
618	652	687



Toronto Sewer Atlas

Large Chamber

Manhole
- Combined
- Dual
- Sanitary
- Storm
- Foundation

Control Manhole
- Combined
- Dual
- Sanitary
- Storm

Outfall
- Outfall

Sewer Pump Station
- Sewer Pump Station

Catchbasin
- Other
- Twin Inlet Catchbasin

Sewer
- Foundation Drain
- Combined
- Sanitary
- Storm
- Combined Trunk
- Sanitary Trunk
- Storm Trunk
- Abandoned Sewer
- River
- Highway
- Curb
- Wards Boundary

Third Edition
Date: 01/09/2010

0 50 100 150 200 Metres

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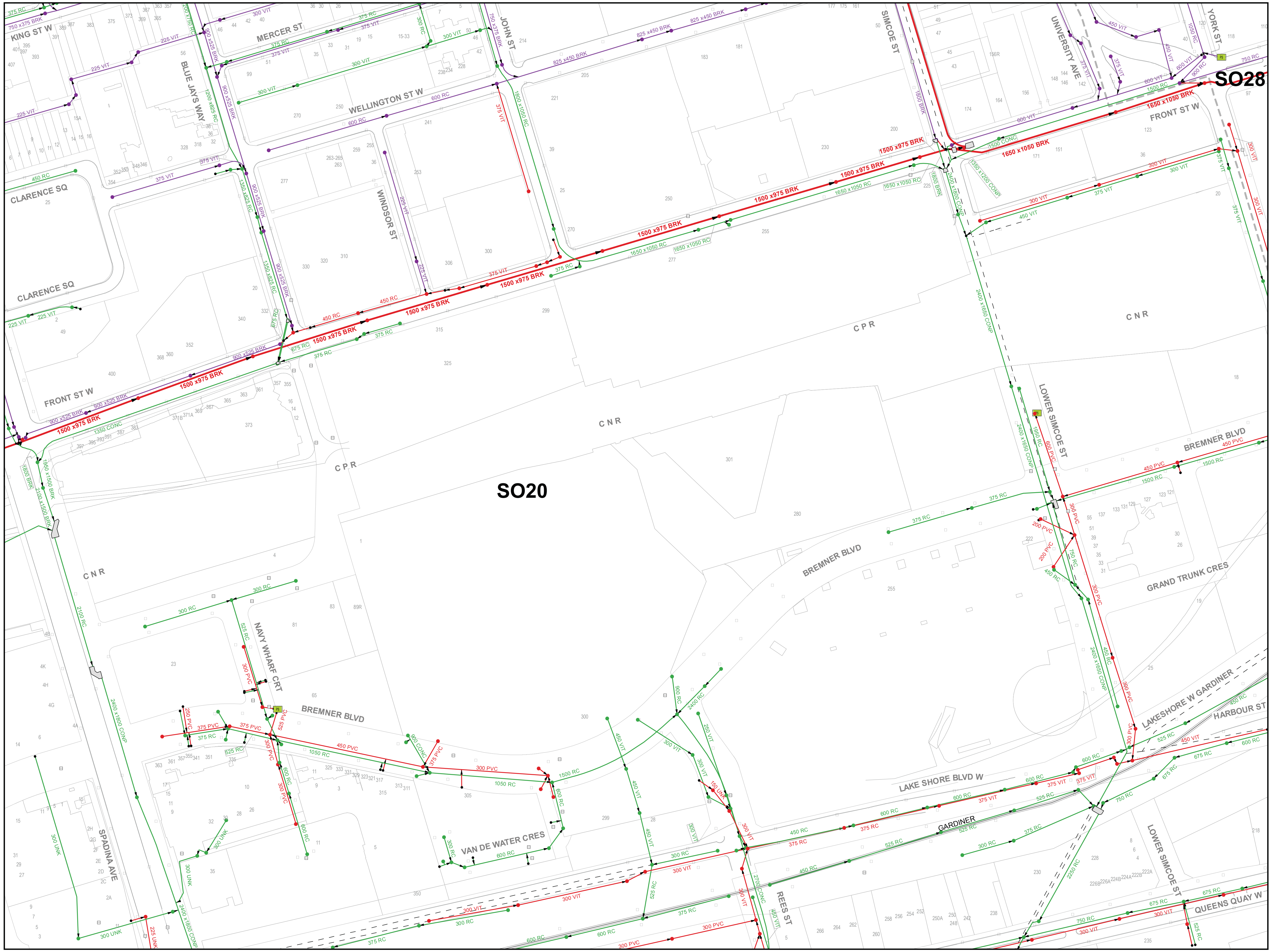
N
W E
S

617	651	686
618	652	687
619	653	688



Toronto Sewer Atlas

Large Chamber

Manhole
- ● Combined
- ● Dual
- ● Sanitary
- ● Storm
- ● Foundation

Control Manhole
- ■ Combined
- ■ Dual
- ■ Sanitary
- ■ Storm

Outfall
-) Outfall

Sewer Pump Station
- Sewer Pump Station

Catchbasin
- Other
- Twin Inlet Catchbasin

Sewer
- Foundation Drain
- Combined
- Sanitary
- Storm
- Combined Trunk
- Sanitary Trunk
- Storm Trunk
- Abandoned Sewer
- River
- Highway
- Curb
- Wards Boundary

0 50 100 150 200 Metres

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N E S W

618	652	687
619	653	688
620	654	689

APPENDIX F

Topographic Survey

METRIC : *DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048*

PART 2 :

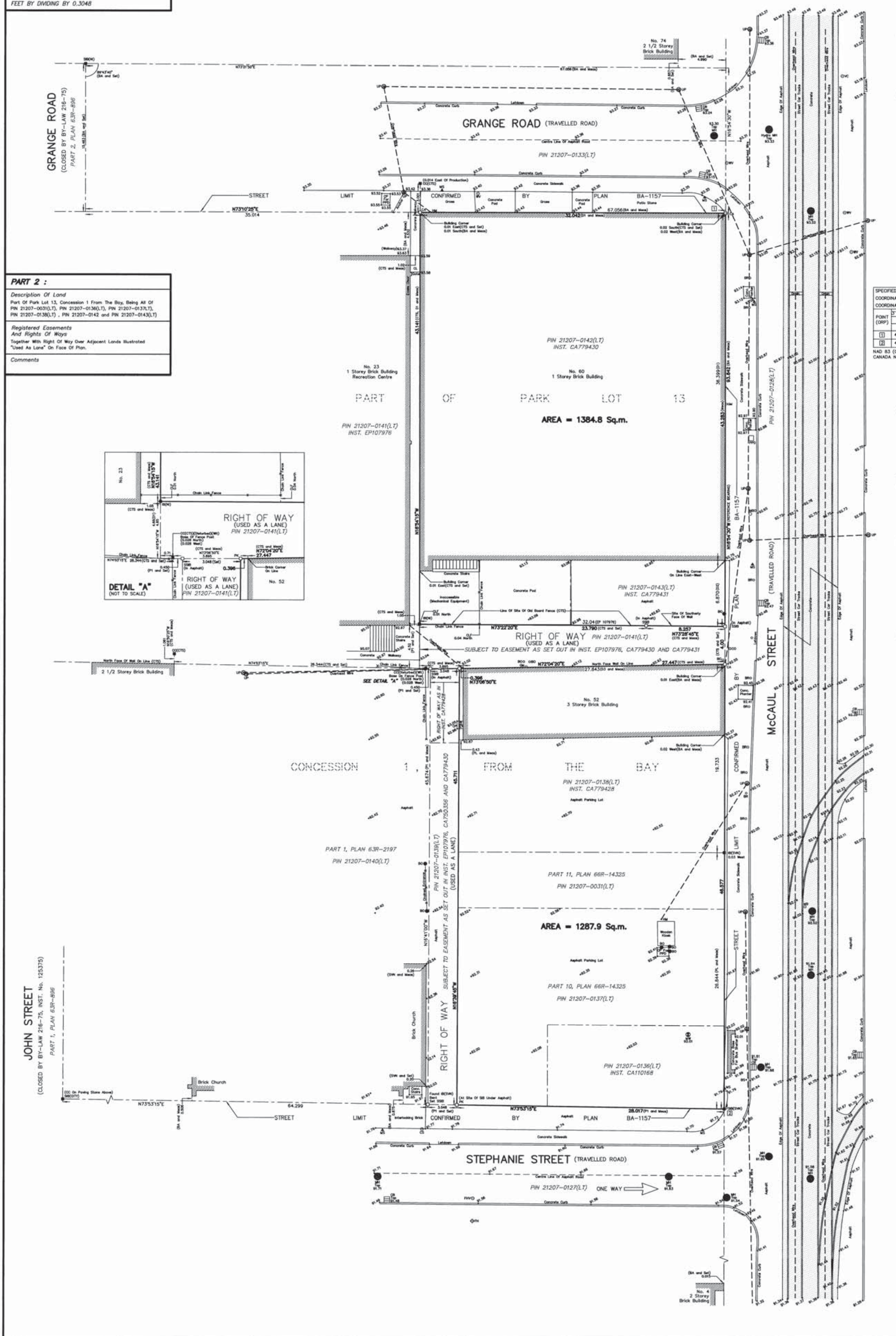
Description Of Land

Part Of Park Lot 13, Concession 1 From The Bay, Being All Of PIN 21207-0031(LT), PIN 21207-0136(LT), PIN 21207-0137LT), PIN 21207-0138(LT) , PIN 21207-0142 and PIN 21207-0143(LT)

Registered Easements And Rights Of Ways

Together With Right Of Way Over Adjacent Lands Illustrated "Used As Lane" On Face Of Plan.

Comments



SURVEYOR'S REAL PROPERTY REPORT
PART 1

PLAN OF SURVEY AND TOPOGRAPHY

PART OF PARK LOT 13
CONCESSION 1 FROM THE BAY
CITY OF TORONTO

SCALE 1 : 150

0m 5m 10m 15 metres

I.M. PASTUSHAK LIMITED
2013.

INTEGRATION DATA

SPECIFIED CONTROL POINTS (SCP'S)
COORDINATES TO URBAN ACCURACY PER SEC. 14(2) OF O.REG. 216\10
COORDINATE SCHEDULE

POINT (ORP)	3° MTM NAD27 (1974 ADJUSTMENT)		3° MTM (CSRS) NAD83		DESCRIPTION
	ZONE 10, CENTRAL MERIDIAN 79°30' WEST LONGITUDE				
	NORTHING	EASTING	NORTHING	EASTING	
1	4 834 494.010	313 599.580	4 834 716.079	313 615.363	BA-1157(Set CA)
2	4 834 404.234	313 626.868	4 834 626.310	313 642.655	BA-1157(Set SSIB)

NAD 83 (CSRS) COORDINATES ARE DERIVED FROM NAD 27 USING MINISTRY OF NATURAL RESOURCES CANADA NTv2 TRANSFORMATION MATRIX AND CITY OF TORONTO GRID SHIFT FILE TO27CSv1.gsb

BEARING NOTE

BEARINGS SHOWN HEREON ARE GRID BEARINGS AND ARE REFERRED TO THE WESTERLY LIMIT OF McCAUL STREET, AS SHOWN ON PLAN BA-1157, HAVING A BEARING OF N16°54'30"W AND ARE REFERRED TO THE CENTRAL MERIDIAN 79°30' WEST LONGITUDE 3° MTM ZONE 10, NAD 27 (1974 ADJUSTMENT)

DISTANCE NOTE

DISTANCES SHOWN ON THIS PLAN ARE GROUND LEVEL DISTANCES, TO CONVERT TO GRID DISTANCE MULTIPLY BY COMBINED SCALE FACTOR 0.999886

BENCH MARK

ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO CITY OF TORONTO BENCH MARK No 540, ELEVATION = 93.982 SE COR GRANGE RD AND JOHN ST BM ON 2 STY BRICK BLDG 0.43M S FROM NW COR 0.47M ABOVE GRADE

NOTES

☐	DENOTES	SURVEY MONUMENT SET
■	DENOTES	SURVEY MONUMENT FOUND
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	STANDARD SHORT IRON BAR
IB	DENOTES	IRON BAR
Meas	DENOTES	MEASURE
CC	DENOTES	CUT CROSS
Wit	DENOTES	WITNESS
PK	DENOTES	PK NAIL WITH OLS WASHER
CA	DENOTES	CUT ARROW
NI	DENOTES	NOT IDENTIFIED
BA	DENOTES	BOUNDARY ACT PLAN 1157
D1	DENOTES	INST. CA 779430
D2	DENOTES	INST. CA 779431
D3	DENOTES	INST. CA 779428
D4	DENOTES	INST. CA 110168
PL	DENOTES	PLAN 66R-14325
P1	DENOTES	PLAN 63R-2197
CTS	DENOTES	CITY OF TORONTO SURVEYORS DATE AUGUST 15, 1973
CITY	DENOTES	CITY OF TORONTO SURVEY DEPARTMENT
SVN	DENOTES	SPEIGHT & VAN NOSTRAND LIMITED DATED NOVEMBER 20, 1980
PPD	DENOTES	PARKING PERMIT DISPENSCR
CP	DENOTES	CONCRETE PAD
MH	DENOTES	MANHOLE
CB	DENOTES	CATCH BASIN
FH	DENOTES	FIRE HYDRANT
FHV	DENOTES	FIRE HYDRANT VALVE
MS	DENOTES	METAL SIGN
BS	DENOTES	BUS STOP
CP	DENOTES	CONCRETE PAD
UP	DENOTES	UTILITY POLE
MB	DENOTES	METAL BOX
MW	DENOTES	MONITOR WELL
BO	DENOTES	BOLLARD
BR	DENOTES	BIKE RACK
GM	DENOTES	GAS METER
CO	DENOTES	CLEANOUT
AD	DENOTES	AREA DRAIN
HM	DENOTES	HYDRO MAST
MBO	DENOTES	MESSAGE BOARD
WV	DENOTES	WATER VALVE
VC	DENOTES	VALVE CHAMBER
CL	DENOTES	CONCRETE LANDING
CS	DENOTES	CURB STOP
CS	DENOTES	CHAIN LINK FENCE

ELEVATIONS ON CURB TAKEN AT GUTTER UNLESS NOTED OTHERWISE

THIS REPORT WAS PREPARED FOR DELNOVA DEVELOPMENTS LIMITED.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :

1) THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM

2) THE SURVEY WAS COMPLETED ON THE 1st DAY OF May , 2013.

DATE : May 9, 2013

P Hofmann
P HOFMANN
Ontario Land Surveyor

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
1852544
THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR In accordance with Regulation 1026, Section 29(3).

I.M. PASTUSHAK LIMITED
A wholly owned subsidiary of J.D. Barnes Limited
Ontario Land Surveyors
4800 DUFFERIN STREET, ENTRANCE "G", DOWNSVIEW, ON M3H 5S8
T: (416) 661-1463 F: (416) 661-3249 www.jdbarnes.com

DRAWN BY: GL	CHECKED BY: PH	REFERENCE NO.: 13-15-016-00
CAD FILE: 13-15-016-00		DATED PLOTTED: 05/06/13

R.V. Anderson Associates Limited
engineering · environment · infrastructure

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www.rvanderson.com